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JPRS-UNE-87-014

12 FEBRUARY 1987

USSR Report

NATIONAL ECONOMY

EKO: ECONOMICS AND ORGANIZATION OF INDUSTRIAL PRODUCTION

No 11, NOVEMBER 1986

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Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.

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PUBLICATION DATA

English title : EKO: ECONOMICS AND ORGANIZATION
OF INDUSTRIAL PRODUCTION No 11,
November 1986

Russian title : EKO: EKONOMIKA I ORGANIZATSIYA
PROMYSHLENNOGO PROIZVODSTVA

Author(s) :

Editor(s) : A. G. Aganbegyan

Publishing House : Izdatelstvo "Nauka"

Place of Publication : Novosibirsk

Date of Publication : November 1986

Signed to press : 15 September 1986

Copies : 154,000

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i organizatsiya promyshlennogo
proizvodstva", 1986

IMPORTANCE OF GOAL-DIRECTED PLANNING STRESSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 3-12

[Article by V. S. Solovyeva, Hero of Socialist Labor, general director of the Production Sewing Association imeni 40-Letiye VLKSM (Tiraspol): "Target Orientation--A Command of the Time"]

[Text] The development of our country's national economy can be accelerated by various devices. One of the most effective and least capital-intensive is target management. The goal, according to Marx, is a previously conceived result of activity. Customary as it has become, it is still difficult to overestimate its definition. It links the formulation of the goal with the final result. Let us consider from this standpoint the situation that has emerged in light industry.

As in any other branch, the main goals here have changed. Before the war it was necessary first of all to create the branch itself and to lay its material and technical base. After the war the goal was to provide clothing and footwear for each Soviet person. It seems that we achieved this goal by the middle of the 1960's or the beginning of the 1970's. Perhaps it was at this point that we should have made a radical revision of the goal substantiation of the work of sewing workers so as not to allow the situation that has arisen now.

Unfortunately, this was not done. The sewing workers in recent years have delivered to trade billions of rubles' worth of items for which there is no demand.

In the modern stage it would seem that goal substantiation is one of the most important conditions for increasing the effectiveness of the operation of enterprises. I shall refer to the experience of our association.

Our sales volumes have increased almost three-fold during the past two five-year plans and today it amounts to about 100 million rubles, the output-capital ratio has doubled, and the assortment of products has been expanded. Today we offer the consumer 320 various models, up to 70 percent of which (or more than 200) are new ones.

As compared to branch normatives, labor expenditures are in the range of 50-65 percent, and all this is with the models becoming more complicated and greater demands being placed on quality, while the quality indicators have increased more than 6-fold during this period. Under the 11th Five-Year Plan the output of items with improved consumer qualities (with the index N and sold at contractual prices) increased. Their proportion today is 52.3 percent of the overall output.

The enterprise's profit is increasing annually and today it amounts to 13 million rubles.

But the main thing is that there is a consistently high demand for the association's products, not only within the republic, but also throughout the country. Additionally, we annually receive orders for the delivery of items to foreign firms. The FRG, Poland and Cuba, and the volume of foreign orders greatly exceeds our production capacities. Thus from the standpoint of market criteria our products are competitive.

But what does this depend on?

We understand the ability to compete primarily as the ability of a given collective and all of its services to produce high-quality products that correspond to the best world models with a minimum of labor and material expenditures. To develop such a collective is the content and the formulation of the major goal.

This being the case, the center of gravity in organizational work should be shifted to the solving of sociopsychological problems. And the most important of these is to develop an acute and stable sense of professional and purely human worth, both individual and collective. Every worker and every collective should be convinced that they are producing "the very best" products with the least expenditure of time and money.

On the purely psychological plane this is understandable: there is not a single person who wishes to work poorly, and certainly there is no one who wishes to do something worse than he did it before. With such an approach new interrelations arise. In a collective, each individual should feel confidence in the other work. The worker should be convinced that the entire complicated process of manufacturing the item has been well worked out by the engineering services and it now left for him to demonstrate his abilities and put the fabric under the needle. The engineer, in turn, should be convinced that the worker will skillfully perform all of the technological systems of operations that are envisioned, and so forth.

All this requires principally new methods of educational work that are intended for the peculiarities of the modern worker and active influence on the deep factors in the behavior of the workers and of the collectives of brigades and shops. And here too our work is well arranged for a particular and clear goal--social justice in all aspects of management, understood here as careful development of all conditions for the most "full-blooded" actualization of the individual's personality in production. Therefore questions of norm-setting, organization and payment for labor, professional

training and increased qualifications and the complex of concerns for the adaptation of workers in the collective in all stages of their activity--from the young worker to those who intend to go on pension in a year or two--organically merge into a unified whole.

Everything we do for the individual at the level of creating comfortable conditions in production and developing cultural inclinations (we have introduced progressive flow lines and efficient organization of labor, we have created green zones for recreation in the shops and on the roof of the production building, we have constructed a Palace of Culture, vacation facilities on the Black Sea coast, a medical and sanitary facility, a consumer service combine and so forth) also instill in people a love for their home enterprise and a desire to work at full force with a creative approach to the matter. In these circumstances we discover personnel who are capable of taking advantage of all possibilities for solving any problems--be they technological, technical or any others. Personnel comprise the main factor that enables us to maintain our goal orientation toward the consumer.

For many years now our collective has been utilizing the strategy of innovation, without which our successes would have been impossible and without which it would have been impossible to advance at all. During the course of this search we have developed and introduced methods of efficient utilization of fabrics, comprehensive mechanization of cutting, and scientific organization of production and management, and also systems for controlling quality, effectiveness and the education of the collective, and comfortable conditions have been created for work, rest and daily life.

Let us consider more concretely how the target approach "works" when solving, for example, technological problems. Out of an overall number of 320 models that are produced, half are developed right at the enterprise. These include those jackets that are popular with men. Both experienced and young designers create them equally successfully. Those who were there when the enterprise was created have accumulated rich experience along with those who are quite young and inexperienced. The secret is fairly simple: there is an efficiently worked out system of accumulation of the best experience for the production of competitive items which we call the universal automated selection system for the achievement of the goal. It is based on principles of comprehensive unification which pervade all stages of the life cycle of the product (planning, manufacture, sale, operation) and thus form an integrated flexible technological system for providing for the output of high-quality items.

The introduction of 100 percent unification of parts has provided for extensive design and technological continuity between the new and the assimilated model. The new model, regardless of how complicated the one demanded by the consumer may be, is built out of unified components and only a completely new part or technological component will have to be developed completely. Unification of design makes it possible to unify technology. Unified technology makes it possible to use computers to mechanize the compilation of systems for the division of labor, to apply standard devices, to design semi-automated equipment and to create integrated sets of equipment or specialized flowlines with an optimal capacity for producing high-quality items that have been programmed ahead of time.

Among the advantages of comprehensive unification is the possibility of block replacement of labor expenditures and norms for the utilization of fabrics, as well as the calculation of prices and other elements of the preparation of production. But there is only one conclusion--the principle of unification that lies at the basis of the technological system is flexibility in design, and this means prompt appearance of the new model of the item. This is flexibility in production, and it means prompt appearance of fashionable items in trade; it means reduction of labor and material expenditures, and this means increased effectiveness of production.

Of course, both unification and the system itself are technical parameters; they are means of achieving the goal that has been set: the production of high-quality, competitive items. The main thing, I repeat, is not to let the innovative spirit dry up, or let ideas that nourish such a system come to an end. And this is our "golden key": the goals and the tasks change, but the collective searches for ways of resolving them.

Thus a common goal pervades all of the enterprise's activity: technology, organization, economics and management, which, in the final analysis, also provide for the achievement of this goal.

It is not only the technological service's activity we arrange according to this principle. Several years ago, in our opinion, at quite an appropriate time, we changed the entire management system over to the target principle.

The old linear-functional structure proved to be completely unsuitable even with the first trial at setting the new goals: it could not be harmonized with the comprehensive approach because it reduced the contact among the services and this meant also the mobility in restructuring all of production for a rapid change in the assortment and constant updating of the output. In essence, it could not accommodate the new areas in activity such as prognostication and study of the demand, long-range planning of the organization of production, and the development of target programs and indicators of the results of management.

The improvement of the coordination of services and the uniform degree of stability and flexibility of management provided for the application of the target-program approach, on the basis of which the target-block structure was created. Its peculiarities and capabilities have been fairly well described in special literature, and therefore I shall discuss only certain peculiarities of our organizational structure.

The agencies assigned to fulfill the target programs were the so-called target blocks, and there are eight of them in the system: planning and economics; engineering support; technical service; production-sales; living-domestic; resource provision; quality control; social development; and education of the collective.

As distinct from other organizational structures, each block was assigned not only production goals, but also, mandatorily, social goals.

The process of improving the structure and technology of management is going on constantly, for in order to do this there is no need to change the duties of the specialists, but simply the program of their actions. The autonomous independence of the blocks (and they have been delegated almost all the authorities of the director) develops the professionalism of the deputies, motivates them to streamline their activity, and generates a spirit of competitiveness and enterprisingness. Moreover, even with all of the production interruptions and difficulties, the collective "lives" a normal life and all the blocks operate according to their programs. And the top-level managers have been given the opportunity, as it were, to "look beyond the horizon," that is, into the distant future. The primary goal of this strategy developed by the highest level of management long ago rid us of emergencies and the "Damocles sword" of trivia.

We have relieved the head engineer of an immense amount of work for operational guidance of production and assigned this section of his work to the deputy for production. Now the engineering service has indeed become an engineering service and engages in long-range problems.

A special position in the system has been assigned to management of "social resources," since our sewing industry is more a human system than a system of machines. The quality of products that are produced, the constant increase in labor productivity and, in the final analysis, the effectiveness of production depend on the stability of the collective, its discipline, its professional and skill level, its solidarity and the sociopsychological comfort in it. The development of the social and personnel policy and the target programs for stabilizing, professionalizing and improving the climate in the collective as well as the management of all educational work in the collective are concentrated in the social block which is headed by one of the deputy directors. The social block has created its own management staff which was previously separate personnel subdivisions which are now joined into a unified social-personnel service. The local educational work (in the brigades) is carried out by members of the brigade council who have been given this authority; at the level of the shop this work is led by the senior social psychologist, and he has the status of deputy shop chief for educational work. For cooperation (along the horizontal and the vertical) this block has created a pedagogical council whose task is to analyze and improve the educational process.

The people, the collective--these are our invaluable storehouse. Everything for which our enterprise is known is the fruit of their self-sacrificing labor. The collective's assets include 132 victories in all-union competition (more than 30 years in a row!), two banners of honor of the CPSU Central Committee, the AUCCTU and the USSR Council of Ministers for success in improving quality and the effectiveness of production, the Order of the Labor Red Banner, the State Prize of the USSR and the prize of the Lenin Komsomol--for the development and introduction of a comprehensive system for quality control and for brigades with all-around excellent quality.

Such is our conception of the target orientation of activity under the conditions of a large sewing association. Our experience in this area enables us to draw the conclusion that it is possible to change over to the target

principle at the level of the ministries as well. For instance, instead of the traditional divisions in the ministry, why not have divisions with more concrete and clear-cut goals? For example, the division for increasing labor productivity, the division for increasing the effectiveness of capital investments, the division for increasing the output-capital ratio, or the division for reducing labor expenditures. Why not formulate the goal in the very title of the division?

It is quite possible that this problem could be resolved in some other way, but one thing is clear--target substantiation should begin from above, and only then will each concrete performer from below do everything possible in order to achieve the goals that have been set. He will do it creatively, with initiative, and without excessive expenditures of human and material resources.

The more so since there has accumulated a number of issues of a general nature which each enterprise cannot solve for itself. I shall discuss only the most crucial problems in the organization of sewing production which impede the output of high-quality competitive products.

The time of the military expenditures and the difficult postwar times have long passed. Today all of our people have shoes and clothing. Real, reasonable needs have generally been satisfied. Under these conditions one of the most important goals for sewing workers is to analyze, predict and develop the demand. This is where sewing production must begin today. Prediction of the demand is a state task. This kind of service should be at the source, at the beginning of production. One can state boldly that without it a considerable proportion of the products will not be sold.

But studying the demand is only one goal. Another, no less important and crucial one, is the formation of the demand, the formation of man's reasonable demand for clothing.

I am confident that we are now "driving" the sewing industry after clearly pseudoneeds. Let us recall what happened to platform shoes.... There was a boom and then it disappeared. And millions of pair of unneeded footwear lay on the shelves. This amounts to an immense amount of labor, raw material, processed materials that are in short supply, energy and labor resources.

There is also another problem. Frequently the fashion magazines impose on the sewing workers a radical restructuring of their work which is in no way justified, for which, incidentally, they bear no responsibility. All the responsibility lies with the labor collectives who plan from the level achieved regardless of how complicated the models may become.

With all due respect to the creative fantasy of the fashion designers, we would like for the development of the directions in fashion to be placed on a scientific basis; so that in their quest for originality the artists do not forget about the economic consequences of their activity; so that their creative search is based on a profound knowledge of the market conditions and is directed not only toward satisfying various demands of the consumers, but also toward educating their tastes. This is why we consider scientific

organization of prognostication, study and formation of the demand to be a most important goal which is necessary for the achievement of the goal of the next level--the output of high-quality, competitive products.

Without receiving exhaustive market information under a centralized policy, we have done the best we could to organize the prognostication and study of the demand through our own forces--we visit the stores, we hold open house in the association, we organize exhibits of future models, and so forth. We even try through our own efforts to educate the consumer, to form his taste, and to teach him reasonable consumption. Our specialists, for example, have developed a streamlined wardrobe that is intended for people of different sexes, ages, professions and so forth. But "home grown" methods are not the solution to the problem. The problem of prognostication and formation of the demand must be resolved on a statewide scale.

The same thing applies to technical provision of product quality. Today we are faced with the task of making sure that our sewn items can compete well in the world market. Soviet sewing workers have plenty of experience and mastery. They are ambitious and conscientious in their work. But still we are frequently unable to compete with foreign sewing workers in terms of the quality of our work because of the poor quality of equipment that is supplied to our enterprises. It has long been time for technical reequipment of the sewing branch. And this must begin with reconstruction of the machine-building enterprises. The arrears in the area of production of relatively uncomplicated sewing equipment look simply absurd.

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INNOVATION SEEN AS AREA FOR INTENSIFICATION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 13-23

[Article by V. I. Belousov, candidate of economic sciences, Voronezh Polytechnical Institute: "Intensification of the Innovation Movement"]

[Text] A study of the statistical data concerning the development of invention and efficiency work since 1945 indicates the existence of a close and stable tie between its indicators and the change in the growth rates of the productivity of public labor. The coefficient of the correlation is 0.997, which indicates the existence of a clearly expressed linear link between the degree of development of invention and efficiency work and the productivity of public labor.

Beginning in 1975 there has been a significant reduction of the rates of development of invention and efficiency work. Recent years (1983 is the only exception) have been characterized by a reduction of the increase in the number of authors of innovations that have been submitted and introduced. In addition to this, two-thirds of all the inventions that are created and about 14 percent of the efficiency proposals that are adopted are not realized in production at all.

If one tries to evaluate the factors that predetermine the reduction of the innovation movement, this is what can be noted.

In the first place, one can trace a tendency toward a sharp reduction of the innovative activity of specialists. As one can see from the figures in the table, since 1950 the number of applications submitted per registered author has decreased to one-half, and the number of proposals per one specialist with a higher education has decreased to one-third.

In the second place, the reduction of the quantitative indicators of the innovation movement is accompanied by a deterioration of the qualitative indicators as well. This process is reflected first and foremost in the indicators of the results of measures for scientific and technical progress (plans for new technical equipment, organizational and technical measures, and so forth).

Table--Indicators of Creative Activity of Innovators and Specialists
of the National Economy With Higher Education

<u>Names of Indicators</u>	<u>1950</u>	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1970</u>
Number of proposals submitted per one author	2.24	1.83	1.64	1.38	1.27
Number of proposals introduced per one author	1.18	1.01	1.06	0.97	0.93
Number of proposals per one specialist with higher education	--	0.4	0.45	0.34	0.27
Savings per one invention or efficiency proposal, thousands of rubles	7.6	5.4	5.74	6.73	8.75
Savings per one measure from results of implementation of plans for new technical equipment, thous. of rubles	--	--	--	--	6.57

<u>Names of Indicators</u>	<u>1975</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>
Number of proposals submitted per one author	1.18	1.01	1.06	1.07	1.05
Number of proposals introduced per one author	0.91	0.88	0.87	0.86	0.86
Number of proposals per one specialist with higher education	0.22	0.17	--	0.16	0.15
Savings per one invention or efficiency proposal, thousands of rubles	12.08	17.0	17.4	17.5	17.55
Savings per one measure from results of implementation of plans for new technical equipment, thous. of rubles	6.16	6.2	5.66	6.16	6.43

The weakening of the creative activity of specialists has contributed to a labor-saving and resource-saving functions of scientific and technical progress in the national economy and has worked against the maintenance of the necessary rates of economic growth.

The contribution of inventors and efficiency experts working in scientific and planning organizations, VUZes and enterprises to the acceleration of scientific and technical progress varies. According to data of the VNIIGPE, about 65 percent of the inventions are registered by scientific and design organizations as part of the fulfillment of their job assignment while more than 60 percent of the efficiency proposals are submitted as personal initiatives. For example, in Voronezh Oblast in recent years the proportion of efficiency proposals submitted by personnel of scientific and design organizations and VUZes amounts to 2.6-2.7 percent of the overall number of efficiency proposals, and for workers of agricultural enterprises--8-9.5 percent.

In the country as a whole during the years of the past two five-year plans 98 percent of all the proposals have been efficiency proposals. The proportion

of savings from the utilization of efficiency proposals in the overall volume is decreasing (from 81 percent in 1976 to 61 percent in 1983). At the same time the average savings per one efficiency proposal is increasing, although since 1980 this increase has been insignificant. But the increase in the number of inventions that have been introduced with a reduction of savings per one invention shows the reduced proportion of large-scale, significant innovations that are being utilized in production. This tendency can be traced in a number of branches. [Footnote 1] The nature of the efficiency proposals also shows the existence of two tendencies: toward a reduction in the scale and a reduction in the number of large innovations that are introduced. For example, at Voronezh Machine-Building enterprises about 60 percent of all the efficiency proposals are small improvements that are made in order to eliminate incomplete aspects of the work of the design and technological services of the enterprises. The proportion of proposals directed toward the introduction of means of mechanization and automation of production processes amounts to 5-6 percent, and those of actual technically complicated new developments does not exceed 1 percent.

The activity of specialists in production is excessively weighted in the direction of completing work and improving existing technical decisions, and not creating and implementing principally new developments that are capable of providing for radical progress and, on the basis of this, the proper acceleration of scientific and technical progress. Work is being done poorly for introducing highly effective inventions, especially those that are created in scientific and design organizations but are not realized in equipment that is produced.

As distinct from scientific and design organizations where it is expedient to link the intensification of creative activity to an increased proportion of large-scale innovations, at the enterprises it is important to develop mass measures as well. This will help to develop an active position on the part of all participants in production with respect to the existing shortcomings and problems of various scales, which can be handled by both the worker and the engineer. At the same time, the peculiarity of the modern period in economic development consists in that mass development alone cannot provide for the achievement of the necessary rates of acceleration of scientific and technical progress. In the drive for mass measures, if one does not devote the proper attention to raising the level of innovation proposals, it is possible to be bogged down in trivia and miss in the proposals of specialists those key ideas which would make it possible to essentially increase the effectiveness of production and provide for its accelerated development.

The change in the development of the innovation movement should provide for more favorable conditions for the creation and advancement of innovative ideas. In order to give the possible approaches to the formation of these conditions it would be useful to recall the conditions under which the movement of the innovators developed. External factors impeding the process of intensification of creative work can be seen, as a rule, in the economic mechanism. Of the shortcomings that have been mentioned here one can name the following.

First, the enterprises are not very economically motivated to implement large-scale innovative achievements. Because of the orientation of the economic mechanism toward incentives for immediate results of production, the manager who is in charge of the active innovation policy risks, for example, failure to fulfill the plan for profit, failure to receive sufficient economic incentive funds, overexpenditure of the wage fund, and so forth.

Second, the system of bonuses for the creation and introduction of progressive technical equipment does not operate well. According to data from an investigation of Voronezh enterprises, in the overall sum of bonuses for the results of production activity the proportion of incentives for the creation and introduction of measures for scientific and technical progress does not exceed 2-4 percent. The amounts of the bonuses here are affected by limitations regarding the maximum sums of bonuses as well as bonuses for providing for current production.

Finally, the existing system for legal defense basically protects the idea from being used while sidestepping the author's rights, that is, it protects the interests of the individual. At the same time there is a great deal of social danger in the failure to utilize innovations in general. The law should fulfill two functions: to defend the interests of the authors and to protect the interests of the state in realizing innovations. The first function is now being performed extremely weakly, especially when it comes to solutions to problems of paying the author's remuneration. The lack of decisive actions on the part of law enforcement agencies in this matter gives rise to bureaucratism and red tape, which drives specialists away from activity for creating and realizing large innovations. The law does not perform the second function at all. Everything is under the jurisdiction of the ministries and departments, and the statewide mechanism for the advancement of large innovations is extremely ineffectual.

From the insufficient amount of independence of enterprises and expending resources for stimulating innovation work follows the internal causes of the weak activity of innovators. The provisions of the law concerning labor collectives are utilized poorly not only because of the inertia of economic thinking or the inadequate methodological development of them. A conservative influence is exerted by numerous instructions, guidelines and provisions of state and branch agencies which were not changed or abolished when the law concerning labor collectives was published. Not every manager can risk a conflict with the norm, especially in cases where success from the realization of innovations is not obvious.

Of course one can demand efficiency from the workers of state committees and ministries or courage and readiness to take responsibility from economic leaders. But the effect, in our opinion, will be weak if we do not at the same time introduce a system of measures capable of instilling in specialists a desire to create progressive innovations and fight for their realization, to act in spite of the lack of the managers' desire to take a risk, references to the imperfection of the economic mechanism, and so forth. Innovators are caught up in trivia largely because the barriers that are difficult to surmount that appear on the path to realizing progressive innovations and are disproportional to the results of the expenditure of nervous and labor energy

frighten capable specialists away from submitting radical innovations. An innovator should be given firm guarantees that the creative approach he takes to a matter, his irreconcilability to bureaucratism and inactivity will not put him in a position where his rights are diminished because of his recalcitrance when paying remunerations and bonuses, distributing benefits, and so forth.

In order to change over to mainly intensive development of creative activity and production it would be expedient to change from a quantitative orientation to a qualitative one, an orientation not so much to the number of proposals and innovators as to the significance (effect) of each proposal. The authority of the creative labor of the specialists at enterprises will increase when labor is paid for depending on the contribution to the acceleration of scientific and technical progress.

In the intensification of the innovation movement it would be expedient to single out three groups of functional directions for influence which are joined into packets of methods: the formation of incentives for business activity; influence on cognitive activity and skills, and organization of the realization of innovations.

A radical change in the direction of reorienting the innovation movement in production toward the intensive path of development can be achieved with an expansion of cost-accounting interrelations between innovators and their organizations concerning the introduction of innovations.

Promising experience like this is being accumulated at certain enterprises of Voronezh Oblast where they are managing to form strong temporary introduction collectives. In short periods of time they provide for the introduction of large innovations which have not made progress for a long time because of various objective factors: the loading of scientific and technical subdivisions of the enterprise with planned work, rejections of scientific and design organizations and so forth. In just one production association, Elektrosignal, the activity of 26 temporary introduction creative brigades, as a result of accelerating the introduction of progressive innovations, provided for an additional savings in the amount of more than 2.3 million rubles, with expenditures on payment for labor to members of the brigade of about 29,000 rubles. In the production association for producing forge and press equipment imeni Kalinin, expenditures on payment for cost-accounting introduction brigades amounted to about 3,900 rubles. But from the introduction of the adapters they developed and manufactured the savings were more than 400,000 rubles. The activity of cost-accounting introduction brigades has breathed life into public design and technological bureaus which had been inactive because of a lack of material incentives. The quality of the work of the cost-accounting introduction brigades is higher than that of participants and mechanization shops. Earning money honestly has its effect. The introduction brigades do not have to leave their work for supervising and adjusting the innovations, and at the first demand of the production workers they eliminate shortcomings and check on their projects until they have been completely mastered by the workers and mechanics of the shop.

In the cost-accounting system of utilizing the results of innovation work one can also see ways of improving the economic mechanism. Thus the existing norms limit the scale of its dissemination to the wage fund set for the enterprise. As a result, the administration of the enterprise is more willing to conclude an agreement with creative brigades for the introduction of innovations that contribute to savings on this fund. And, conversely, there are all kinds of impediments when it comes to realizing innovations that save on materials and batching items, that is, on labor expended at other enterprises. It is clear to everyone that for the national economy as a whole the advantage is achieved as a result of savings on past labor. But the risk of overexpenditure of the wage fund of the enterprise itself makes it possible to be concerned about statewide interests.

There is some point in generally changing bureaus for efficiency and invention work over to cost accounting. For instance, up to 20 percent of the savings obtained from the introduction of proposals of innovators could go into the innovation fund of the enterprise. The bureaus for efficiency and invention work could also be given the right to conclude agreements with the enterprise and the innovators for solving problems and streamlining solutions that have already been found as well as settling accounts with the innovators. The problem is that now people try to cover losses from inefficiency by using the savings obtained from the realization of the discoveries of inventors and efficiency experts and in their accounts they reduce the savings from innovative proposals in order to use them later when the norms are revised.

It is also necessary to restore the intermediary introduction organizations like the Novosibirsk Fakesakel and the Baku Novator, giving them the opportunity to work both on the basis of contractual agreements with the enterprises and with money from a special innovation fund. The goal of the latter consists in realizing progressive innovations for which there will be no specific client until the new positive effect from their assimilation is proved experimentally.

The statewide normatives that are currently in effect, while they grant benefits to the innovators, essentially contain no instructions to make it possible to understand these norms as clear-cut guarantees that they will be carried out by the administration. This shortcoming must be compensated for in the internal documents of the enterprises. For example, in the collective agreement between the administration and the trade union organization, it is necessary to stipulate concrete results which, when achieved, will give the innovator the right to obtain benefits without conflicts. For instance, if an innovator has created a progressive machine or adapter or has saved a certain quantity of resources he should receive an increment to his wages, the right to purchase an automobile out of turn, additional housing space, addition vacation and so forth. For example, in the Voronezh Elektrosignal Production Association, under the leadership of the general director, N. A. Potapov, a system of intensification of the creative activity of personnel is being realized. Upon the introduction of their innovations members of creative brigades are given a personal increment to their wages for a period up to 12 months, depending on the savings, in an amount from 10 to 15 rubles, they are given preferential passes to sanatoriums and houses of recreation, they are first to be sent on creative business trips, and so forth. As a result, the

workers of the association can actually see the advantage and respectability of the innovative approach to performing production functions.

There is a need to create creative laboratories after innovators who have displayed extraordinary abilities in creativity and have promising ideas for the enterprise and the branch. The practice of Voronezh enterprises shows that the creation of these laboratories or simply preferential conditions for outstanding plant workers makes it possible to obtain a range of equipment and instruments that exhibits the world level of innovation.

Methods of rational creative thinking and collective streamlining of production on the basis of methodological principles of functional cost analysis (FSA) and the theory of resolving invention problems are being extensively introduced. With the utilization of methodological principles of FSA a brigade of specialists during the course of a couple of conferences can develop more proposals for reducing the production cost of items than random streamlining of production can produce in several years. [Footnote 2]

At the present time information and patent services are trying to transfer many of their functions to the shoulders of innovators, and the quality of propaganda in exchange of experience are unsatisfactory. When the control over their work slackens these services sometimes slip to a point where they are performing highly paid clerical work or at best they are playing the role of consultants for discovering and detecting inventions. Under the conditions of intensification of production, information and patent services must relieve specialists of the work of searching for and preliminarily analyzing information as well as substantiating the expediency of the protecting inventions. In publicizing advanced experience the specialists should concentrate on various approaches to solving the production problem and have a clear idea of the extent to which the most effective solution corresponds to the specific nature of production.

Certain enterprises have arranged systematic accounting for the technical, organizational-economic and social problems in all production sections, for example, by means of mandatory filling out of accounting cards. Thus in the Voronezh Tyazhmekhpromstess Production Association they have developed and introduced methodological instructions for organizing technical reequipment. According to these, the work begins with the formation of a card catalogue of sore spots which require technical reequipment. These same methodological instructions envision an evaluation of the significance of technical innovations. The system of indicators utilized in the association includes the following criteria for evaluating the significance of an innovation: the scale of system complexity, the degree of progressiveness of the innovation; the potential useful effect, the degree to which it corresponds to the world technical and economic level, and the economic and social effect of the innovation.

There is also an immediate need to change over to paying for the transfer of economic and organizational innovations.

FOOTNOTES

1. VOPROSY IZOBRETATELSTVA, No 5, 1984, p 4; No 5, 1985, pp 11-12.
2. Belousov, V. I., Turovets, O. G., Shipilov, V. G., "Organizatsiya razvitiya proizvodstvennogo obyedineniya" [Organization of the Development of a Production Association], Voronezh, 1985, pp 40-41.

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TECHNOLOGIES MUST BE COORDINATED FOR EFFECT

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 24-30

[Article by V. Ye. Tikhonov, candidate of economic sciences, Institute of Management imeni S. Ordzhonikidze (Moscow): "The Sum of Technologies? No, Integration!"]

[Text] How a Complex Technological System Is Formed

Exactly half the way from Moscow to Leningrad is the location of an ancient glass plant whose items were well known throughout Russia and abroad during the last century. The plant museum shows work done by old and new masters. In that same place, in the shops, one can see modern mass production, particularly a Belgian automated line on which goblets and other kinds of items are manufactured. In general, it is a line like other lines. At the beginning the raw material goes into the furnace, and at the end the finished items come out.

But still this "miracle from across the sea" leaves one with an impression of some kind of incompleteness. Either engineering thought has not reached the point of automation in its complex form or our foreign trade organizations have "exhibited economy" on currency supplies, but the line was clearly missing a transporting block and an automatic packaging machine. It is strange to see the glass items in their finished stage come through the chute. Many of them are broken along the way, which is quite natural, and then the worker in charge must clean up the pieces by hand, for which she is specially placed there. The packaging is done by hand and the staff of workers in the shop is limited. As a result, it is necessary to stop the highly productive automated line.

Incidentally, this example can hardly be called an exception. Machine production is interrupted here and there by manual procedures, mainly in warehousing and in loading and unloading processes, and also in operations for packaging and sorting various objects of labor. These manual jobs, even in the most modern automated and robotized productions, break up the technological unity of the procedures and are a source of many losses.

When various groups of technicians are joined together into system technology and productions are joined together into complex interbranch formations, the

functioning of all these elements must be synchronized. Since a great deal here depends on incentives, the incentive system should contribute to this kind of synchronization. But up to this point one can state confidently that thousands of our enterprises are existing and operating according to our own schedules, which are practically not coordinated among one another. But not only enterprises of various branches, but also individual productions within the enterprises are operating in isolation, according to their own plans, schedules and indicators. The production process is represented not as an integrated system, but as the sum of technological transformations.

The calculation of the effect is arranged in a similar way. Although certain shops have not fulfilled the plan, others have overfulfilled it and the enterprise as a whole has ended up among those that have fulfilled it. In one place they have made more machine tools and in another place they have made fewer instruments. It is all the same when it comes to receiving money.

Yet in machine systems and complex technologies, the effectiveness considered from the standpoint of their purpose is not the simple sum of the effect from the activity of the productions that comprise it. General economic ties among the enterprises and branches acquire the form of concrete technological interactions. Therefore an increase in the scale of output in one unit, while there are arrears in another does not exert a favorable influence on the products for which the entire system is intended.

Thus when a complex technological system is formed with a particular target orientation, all processes of transformation and servicing of material flows, including salvaging of wastes, are mechanized; production, repair and servicing of equipment are carried out on a unified technological basis; all groups of machines and productions comprising the complexes function under coordinated conditions and operate for the final consumer; the incentives for all participants in the complex technological system depend on the achievement of its final goal.

Integration of productions in the formation of target interbranch complexes provide immense possibilities for increasing the effectiveness of the national economy. It is natural, therefore, that more and more attention is being devoted to these issues. They were included in the Basic Directions for the economic and social development of the USSR during 1986-1990 and the period up to the year 2000, where in the section entitled "Improvement of Management of the National Economy," it says: "To create where necessary interbranch associations that are intended to accelerate the solution to scientific-technical and economic problems."

Objective Tendencies in Horizontal Integration

In the recent period there has been a clear manifestation of the tendency to end production processes not in the stage of assembly of the item at the enterprise itself, but after it has been installed and put into operation by the consumer. The limits of the plants are becoming extremely conventional, and individual machines are no longer the final product, even if the gates of the enterprises close behind them.

In industry and construction we know of many examples of unified set-block technology. Combined technology for the production and assembly of crane equipment has proved to be highly effective. Industrialization of trade and public catering along with comprehensive processing and procedures for storing agricultural products depend on the solution to the problem of integrated interbranch complexes that serve flows of agricultural products, beginning in the field and ending at numerous sales points.

It is quite natural that only in a complex technological system can one determine mutually acceptable requirements on the technical and economic specifications of the elements, machines and functional blocks that comprise it. In these systems transportation, warehouse and transformational functions become not only equally valuable, but also mutually augmenting. And it is difficult to assume here that any units will overfulfill their indicators or that there will be any that do not fulfill them.

But if powerful groups of technologies and new productions are fastened to the old surroundings, frequently they do not work at full force, since when individual kinds of technical equipment are built in there is an incompatibility in productivity. At one time an imported press was installed at one of the large Moscow plants. And it worked (if one can call it work) less than 2 hours a shift. Then it had to be halted, since its products were accumulating in the next technological stages. A somewhat similar situation now exists in the Manometr Association where for 2 years they have been creating a robotized section for press equipment. Now that it has been created, adjusted and is in operation, the annual program with respect to individual positions on the products list is fulfilled in a week. Deliveries of materials and the capacities of instrument shops that produce the fittings cannot manage to fill this automated belly, and large amounts of idle time are created.

Of course the replacement of people with robots in sections with difficult working conditions justifies their application. But the possibilities of the new technical equipment are not exhausted with this. The capacity of the entire system is determined by the "weak" machines and therefore productive technical equipment cannot prove itself. Isolated replacement of one technological group or production creates bottlenecks in other related units.

New technological solutions that are built into old and existing production structures frequently stand out like a sore thumb. They operate poorly themselves and they also hamper the functioning of well-arranged technological processes, but this is not because they are bad in and of themselves. It is simply that the factor of incompatibility is in operation.

In Penza Oblast there is a machine-building plant that produces seeders. Technical progress made its way into this ordinary mass production enterprise and appeared in the form of an automated cold stamping machine. When loaded with sheets, this automated machine "shoots out" parts with complicated configurations as out of a machine gun.

Technology with fewer operations shone in the face of this creation in all its brilliance and grandeur. According to modest calculations, such an automated

machine was to have replaced an entire mechanical processing section.... It was supposed to have, but it did not. It broke down frequently and for long periods of time since the parameters of the belt varied within broad ranges, for which the automated machine was not prepared, the section had to halt its operation and, of course, the presence of such an automated machine only worsened the indicators of output-capital ratio and created a skeptical attitude toward technical innovations.

The need for integration is manifested to the greatest degree in that constituent part of technical progress which is linked to the revolution in the area of technological transformations. The changeover to technologies with fewer operations in combination with their colossal productivity changes the entire sequence of procedures for processing objects of labor. There appears the need to unite technically homogeneous transformations and to create complexes for interbranch service. V. S. Muchnik called these formations metasystems (see EKO No 12, 1982). If such metasystems were joined into sequential or closed technological chains, a network of interbranch productions would be formed. Object specialization goes hand in hand with technological specialization.

Such formations could solve many problems that exist in real productions. Thus salvaging of production wastes, energy and secondary resources in general is difficult within the framework of individual enterprises or even branches. It is precisely here that the intertwining of interbranch technological ties is so complex that one can speak about the need for integrated complexes. It is therefore not surprising that new technological solutions concerning the utilization of secondary resources lead directly to combined integrated technological schemes.

Domestic and foreign practice shows that combined forces in research and applied developments make it possible to achieve high effectiveness of new technical solutions as a result of system technologies. In the United States, for example, companies specializing in the production of chemical products for agriculture work in conjunction with machine-building firms on the creation and improvement of technologies for cultivating the soil. They develop not only a complete spectrum of means of chemical protection, but also means of transporting them, storing them and applying them to the soil.

From all that has been said, there follows the next principle of the development of the production apparatus: capacities should be projected, planned, put into operation, replaced, expanded and modernized not in the form of individual machines, equipment and productions, but in the form of machine systems, technologies and interbranch complexes.

An enriching combine was constructed but the productivity of the loading areas remained the same. As a result, the capacities of the combine were loaded by only 70 percent.

It is better to put one system of machines or large interbranch complex into operation all at once than to spend a long time changing dozens of old technologies part by part. Naturally, such a principle of planning and projection should be reflected first and foremost in the work of central

planning agencies when decisions are made concerning the distribution of capital investments. When they are distributed among hundreds of departments and thousands of enterprises, it is hardly possible to achieve concentration of efforts on the development of large technological systems. Thus it is worth quoting the words of M. S. Gorbachev at the Conference on Questions of Accelerating Scientific and Technical Progress in June 1985: "We must not allow an 'erosion' of capital investments according to the principle of 'a little for each.' In the new five-year plan we must more decisively proceed toward concentration of capital investments in the most economical areas."

And so the horizontal constituent of technical progress consists in uniting new technological solutions into target machine systems and interbranch complexes.

In a socialist society, under the conditions of planned and purposive development of the economy, all objective obstacles are eliminated before integration. It can become a means of solving the most important national economic problems. There appears a real possibility of changing over from an economy based on the sum of technologies to an economic system that functions on the basis of interconnected technological complexes.

This objective process of the development of productive forces depends on many factors. Therefore it should not be impeded. It must be controlled, that is, one must learn to model, project, plan and introduce into the practice of our national economy comprehensive system technologies and large interbranch associations of them.

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INTRODUCTION OF SCIENTIFIC DEVELOPMENTS DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 30-41

[Article by I. L. Kotlyarevskiy, doctor of chemical sciences, laboratory chief of the Institute of Chemical Kinetics and Combustion of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "Science and the Mechanism of Introduction"]

[Text] It would be strange if we demanded from each scientist some return in the national economy each year. It takes an individual researcher a long time (sometimes decades) to obtain a practical result in one fundamental area of science which comprises the subject of his activity and where, in the final analysis, he will produce a return for the state. But from the entire totality of scientists employed in the national economy the state has a right to demand an annual practical return, that is, the 100-fold payment which is due on the investment. And the country "has a right to expect from them discoveries and inventions that provide for truly revolutionary changes in the development of technical equipment and technology," as was noted by the general secretary of the CPSU Central Committee Mikhail Sergeyevich Gorbachev at the 27th Party Congress.

Yet it is no accident that in our country the term "introduction" has become ingrained in the process of realizing scientific discoveries and developments in the national economy, a term which means forcefully introducing into the industrial life of the society that which is new and progressive that has been created by science and technology.

There are reasons for such a situation, which is surprising to any sensible person. The first and main one is the lack of interest on the part of the leaders of branches of the national economy and industrial enterprises in realizing the proposals of science. They find it much more peaceful to fulfill the plan for producing traditional products by 101 percent on the basis of established (although frequently poor) technology than to take the risk of expending funds and labor resources on something new whose progressiveness and advantage can be proved at best only by tests and logical constructions and calculations that involve half the plant (and sometimes consolidated laboratories), which seem doubtful to the individual who is accustomed to the good old reliable methods. Sometimes in order to get their

ideas introduced into production the researchers will even compromise their own conscience and include the leadership of the ministries among the co-authors when applications are submitted for authors' certificates. But even this underhanded way does not always lead to the goal, especially if during the period of realizing the innovation changes have taken place among the leadership.

The second reason is the extremely complicated system by which everything new passes through all the levels and formal obstacles that have been raised between the researcher and the plant in the form of various GLAST's for providing documentation.

The third reason consists in the fact that most frequently the new product, commodity, technology and so forth is produced by certain departments and utilized by others. The consumer waits for a new development and is interested in it since it promises him increased effectiveness of production. But those who are supposed to produce it avoid it in whatever way they can, since its realization promises them nothing but problems.

It is especially difficult for innovations proposed by scholars of the Academy of Sciences to make their way into life. In addition to production, there are also other barriers on their path in the form of ministries and head institutes of branches that have been given the authority to decide the fate of innovations in their specialization. This was the case, for example, with the introduction of our development--the flotation agent "Flotol 7-9."

In 1970 at a conference with the deputy minister with nonferrous metallurgy, with the participation of the leading associates of the Siberian Branch of the USSR Academy of Sciences, under the chairmanship of Academician M. A. Lavrentyev, scientists were given 58 tasks. One of them, namely the task of enriching poor and complex tin ores, interested our laboratory. After 2 years of work we managed to find several classes of organic compounds that were promising for solving the problem. Having selected one of the classes that seemed most promising and available and having resolved all the numerous problems related to developing the technology of production, in 1974 through our own efforts we assembled a pilot installation and produced an experimental batch of the reagent, which we called "Flotol 7-9." During that same year "Flotol 7-9" successfully passed the experimental testing with flotation enrichment of complex tin ores at the Solnechnyy Ore-Enriching Combine (Khabarovsk Kray). The question of its industrial production was raised. At the end of 1974 and the beginning of 1975 this production was already started at the Angara Plant for Chemical Reagents.

Such rapid introduction was possible only because we were dealing directly with the plant where by that time people knew us well and to which we had constantly rendered assistance. The drawing up of the planning and technical documentation and the startup and adjustment work were carried out under the leadership and with the direct participation of the authors of the invention. And the assembly of the installation took only 3 weeks in spite of the fact that the schema for production was considerably more complicated at that time than it is now.

We protected the new flotation agent and methods of producing it with authors' certificates of the USSR and foreign patents (Great Britain, Bolivia and Austria). The introduction of the installation in Angara exerted a decisive influence on the further expansion of the sphere of the application of this flotation agent. "Flotol 7-9" was distributed throughout the entire country and abroad, and extensive laboratory and experimental-industrial tests were conducted on this agent using various ores. The demand for it began to increase rapidly. By the present time the demand amounts to up to 11,500 tons a year, but the production plan has not yet been prepared and there is no production, since the only industrial installation in Angarsk was closed after the fulfillment of the 1983 plan simply because the Ministry of the Chemical Industry had promised to start up a large facility for producing "Flotol 7-9" in 1984.

We turned the initial data for planning the industrial production of Flotol over to the Volgograd chemists as early as February 1981. From that moment strange phenomena began to appear which we did not understand at first. Soyuzorgsintez several times changed its decisions concerning the distribution of production and those who were to carry out the plan. The questions asked of us at conferences and in correspondence frequently caused confusion. For example, it was suggested that we (an academic institute!) provide for the production of Flotol 7-9 in railroad tank cars. It is clear to us now that all that was for only one purpose--to take up as much time as possible. One gets the impression that from the very beginning certain leaders of Soyuzorgsintez and its head institute had planned to eliminate us from participating in the introduction and were simply waiting until we gave them all the information and the head institute could master the process and find ways of getting around our authors' certificate. At that time we had not surmised this and tried to answer all questions exhaustively if they were significant for the planning. We submitted additional recommendations for salvaging all production wastes in order to make the production waste-free.

In October 1984, disturbed by the lack of information about the state of affairs, we made contact with the head engineer of the designers, A. M. Ivanov, who told us that our services were no longer needed since the head institute had submitted initial data for planning the production of "Flotol 7-9" by a continuous process, and the planners had begun to develop a new plan using these data. The director of our institute, Academician Yu. N. Molin, asked the Ministry of the Chemical Industry for explanations but he received no answer.

We were bothered most of all by the fact that the parties responsible for making the decision to change the technology for producing "Flotol 7-9" did not take a serious look at how this change would be reflected in the quality of the product or its properties. Alarmed by what was taking place, we went to the leadership of the Siberian branch of the USSR Academy of Science for help and managed to have a conference in the Ministry of the Chemical Industry in June 1985. But even after this conference little changed. Only the intervention of the CPSU Central Committee, in response to the letter we sent there, led to our being given the planning documentation, and proposals were signed concerning the introduction of large-tonnage production of Flotol under the 12th Five-Year Plan. At the present time we have managed to develop a new

method of obtaining flotation agents of the "Flotol 7-9" type. The application of this device would make it possible to simplify the process even more, to increase productivity many times over, and using the same installation to produce, in addition to "Flotol 7-9," analogues to it which are even more effective in flotation, especially for ores that contain phosphorus. We submitted the technical documentation to Soyuzorgsintez for the new method as soon as we were given the right to authors' supervision. Unfortunately, up to this point events are developing in such a way that we will have to look forward to more battles.

The existing situation, in which the head branch institute is completely in charge and takes advantage of this in order to achieve narrow departmental goals without taking anything else into account, it seems to us, is typical in the introduction of developments created by academic institutes. This practice, in addition to causing material harm to the state, causes even more moral harm to the authors of the developments--those researchers who are trying to do something that is of practical importance--and it destroys the desire of young colleagues to follow their example.

In all of these difficult circumstances there are still two paths which lead good ideas to realization. The first path is the one created by consumers who are critically in need of the new development. The introduce into the movement forces which are so strong that neither ministry workers nor head institutes can resist them. Under the influence of these forces, finally, decisions are made concerning the implementation of the new developments. But the misadventures of innovations do not end here. The following situation can arise (it is not at all hypothetical, but is taken from life). The branch that manufactures the new product requires all the technical documentation necessary for carrying out the working plan. The scientists provide all engineering solutions in keeping with numerous GOST's. The leaders of the head institutes, having spent several years on "appropriation" and "assimilation" of others' ideas and solutions, in the final analysis "approve" them in a very unique way--they take credit for everything and completely eliminate the scientists who created the innovations.

The second path joins the scientists directly to the manufacturing plant, where there are frequently people with a live spirit.

This was the case with another development of specialists of our laboratory. They invented and tested on large pilot installations a new, extremely effective superhigh vacuum oil, "Alkaren," which subsequently underwent testing successfully at numerous enterprises in the USSR and even in the United States. At the Kemerovo Khimprom Production Association there were energetic people led by the head engineer V. R. Kutergin (he was recently appointed general director), who set about mastering the new project. The minister of the chemical industry at that time, who now, unfortunately is no longer with us, Leonid Arkadyevich Kostondov, supported the solution. The association received assistance from the chairman of the Siberian branch of the USSR Academy of Sciences, Academician V. A. Koptug and the general director of the Kazan Vakuummash Production Association, V. V. Leonov, the future consumer of "Alkaren." The installation has now been assembled and is about to be put into operation. This is a very important thing for modern

technical equipment. The purity of the vacuum depends on the quality of the vacuum oil, and this determines the quality of the electron instruments and the percentage of defective work when microcircuits are manufactured for computers.

What must be done in order for the "introduction" itself to take place anyway and to advance scientific and technical progress? First of all the tasks for research must be formulated correctly. Examples of fundamental research in which even during the formulation it was known what the advantage would be in the event of a positive solution, can be given endlessly from any branch of knowledge.

A correct formulation of the task takes into account the most essential and immediate needs of the society, the most important questions which must be answered even today, and the most important problems that will face the society in the foreseeable future. As examples one can give the tasks of enriching ores that are poor in phosphorus. It is not at all a fantasy to suggest that within a couple of decades mankind will not be able to feed itself if there is nothing from which to make phosphorus fertilizers.

The formulation of the task is most immediately related to the system of planning. The modern system of planning, whereby the main flow of tasks proceeds from below, and their approval in scholarly councils of all levels is purely formal, has led to an incredible fragmentation of subject matter and a dispersion of the forces of researchers. This can be an obstacle to large breakthroughs on the fundamental plane and to solving large national economic problems in the foreseeable period.

The plan for each large task (program) should undergo extremely serious testing which, in our opinion, could be like a defense. It would be desirable for each task that is defended to have appointed reviewers, perhaps even the best people from other scientific institutions that have a high level of competence in the issue under consideration. Only those subjects which have been successfully defended would have the right to exist.

A similar procedure could be envisioned for considering reports on the fulfillment of work. The result would be a weeding out of less promising areas and an emphasis on the more fruitful ones. One should not be afraid of closing individual laboratories or entire scientific institutions that have shown themselves to be incapable of formulating the most important tasks or working productively on solving the problems that have been raised. This could produce nothing but an advantage, since it would make it possible to utilize the released forces and means for strengthening the productive areas. Conversely, reducing staffs according to schedules of allocations is harmful. This weakens the good collectives and provides no advantage for the bad ones.

Centralized decrees from above are possible for formulating tasks. There is positive experience in this kind of organization of science in solving problems of atomic energy, radar or space travel, when large-scale closed scientific associations are created, which include specialists in many branches of knowledge.

The most important problems should obviously also be solved by this tested method. But as concerned most of the present and future tasks of the national economy, this system of organizing science is unsuitable because of the following reasons. In the first place, as a result of the unusually large network of scientific institutions and associations and the immense number of researchers with varying degrees of erudition and various interests in them, it becomes difficult to control science from above. In the second place, the system of distribution of tasks from above out of necessity extremely limits and narrows the range of tasks which can be resolved by each scientist or laboratory. In the third place, such a system is quite incapable of taking into account personal erudition and the capabilities of each scientist. I should like to make a couple of general comments regarding this.

First. It seems to us that science should be a self-leading system. But any self-leading system must be programmed. It is our deep conviction that this program of self-leading of science, in order to maximally increase its effectiveness and return to the national economy, should be broad and comprehensive information of investigators concerning tasks of all classes that are facing the national economy and arising before it.

Having received this information, the science will find the concrete applied tasks that are being resolved on the basis of the practice of his present and past work. Frequently these applied tasks will be close in nature to the theoretical work he is doing at the present time. It will be sufficient for him to take a look at his own subject matter in order to satisfactorily resolve an issue which could grow into a problem for other scientists or production workers who do not have specific erudition in this area.

Such a system of including researchers in the solutions to applied tasks entails a certain danger of parallelism. But in the first stages of solving problems, in the stages of familiarization with the state of the issue, contemplation and the appearance of ideas, parallelism is not harmful, but useful since it is known which scientists are involved with the same issue and which comes up with the most original and correct solution. But in order to eliminate harmful parallelism in experimental work it is possible to resort to having the central planning or coordinating agencies sanction each more or less large research project.

The natural form of conveying information is the publication of a periodical bulletin of applied tasks of the national economy. But in no case should the information be divided up according to the branch principle and it should not be distributed according to this principle either: for this would mean missing the entire point. It seems to us that the determination of the forms and the organization of information is within the competence of the State Committee for Science and Technology.

Second. It is necessary to change the policy for approving suggestions concerning the introduction of new developments and preplanning documentation. Instead of head institutes of the branches, it would be expedient to assign this to combined commissions created from representatives of the developing institute, the subbranch that produces the new technical equipment and the subbranch that consumes the new technical equipment, under the aegis of the

State Committee for Science and Technology. This suggestion was brought about by the fact that the head institutes have unscrupulously used and abused their monopolistic positions.

It is also necessary to solve the problem of accelerating and improving the planning of new technical equipment and technology on the basis of inventions and discoveries. There is some question about the assumption of the chairman of the USSR State Committee for Discoveries and Inventions, I. S. Nayashkov, that this problem will be solved by the creation of a special invention-introduction center under the State Committee for Inventions and Discoveries and its branches in various regions of the country with design and technological subdivisions for experimental work. [Footnote 1] It seems to me that this is the same attempt to operate through the forces of a single department while the State Committee for Inventions and Discoveries should be working in direct contact with the State Committee for Science and Technology, which should be given the right to make it incumbent on planning organizations of departments to use money from the state budget to plan experimental production and industrial shops and installations for scientific and technical developments that have been accepted for introduction.

Third is the stage of introduction. It is necessary to make it unconditionally mandatory for the enterprises to fulfill assignments for the introduction of scientific and technical development. If a decision has been made concerning the realization of one development or another at some enterprise, it should be realized precisely within the established time periods. Otherwise the realization is drawn out over many years and the development itself, which could have been producing an immense amount of profit during all these years, as a result of changing conditions loses its significance to a considerable degree. In general, this latter is only a half-measure.

Commenting in IZVESTIYA on the draft of the new law concerning inventions, discoveries, industrial models and efficiency proposals, the chairman of the USSR State Committee for Inventions and Discoveries, I. S. Nayashkov, notes that in order to increase the responsibility for the utilization of specific inventions, it places responsibility on individual enterprises which are granted the rights of managers. I. S. Nayashkov suggests that these pioneering enterprises will be followed by others when they see that there is no risk, but on the contrary, the realization of inventions produces a certain advantage. But this optimism does not seem justified to me. People and production collectives with initiative can be found even now, but an innovation frequently does not move beyond the stage of pioneering introduction. What guarantee is there that now things will be different if the responsibility is placed on only one enterprise. The sphere of dissemination of the valuable innovation is narrowed.

The decree of the CPSU Central Committee and the USSR Council of Ministers, "On Extensive Dissemination of New Methods of Management and Their Increased Influence on the Acceleration of Scientific and Technical Progress," envisions a number of measures for accelerating the realization of new developments. In particular, the manufacture of experimental models and the assimilation of series production of the basic kinds of new items will be

included in the plan for the production of products in physical terms. A system of increments has been envisioned for products for production and technical purposes that correspond to the highest quality category, and there will be rebates for outdated items. In addition to this, it seems, one should increase economic incentives for new technical equipment. In order to increase the motivation to introduce principally new developments, it is necessary to establish for the management of the enterprises (director, head engineer, chief of the PTO, shop chief and leader of brigade of assembly workers) large monetary bonuses. In order to pay them, for example, one should use no less than 10 percent of the annual profit received by the manufacturing enterprise or the consumer enterprise from the introduction of the invention, and they should be paid throughout the entire period when the author's certificate for this scientific and technical development is in effect.

Regardless of how great the payments may be, the lion's share will still remain in the hands of the state.

It is also necessary to improve methods of distribution within the institutes responsible for the developments of money from the economic incentive fund obtained for the fulfillment of contractual work with a guaranteed economic effect. It is necessary to revise the provisions whereby most of the fund (no less than 80 percent) would go into the hands of the authors of the development.

Finally, one more issue which I would like to discuss pertains to incentives for the introduction of original developments that are protected by authors' certificates. The existing system whereby the author's honorarium should be paid by the enterprise that has introduced the development is unsuitable for several reasons.

First, the plant gives to an outside person money which it usually uses for its own workers. Therefore it is not advantageous for the enterprise to give the author of the invention credit for a large economic effect since this immediately has a negative effect on the plant's financial condition.

Second, as soon as the plant has begun to produce products at a lower production cost, the price of this product immediately decreases, which can lead to a failure to fulfill the financial plan. Because of this it is disadvantageous for certain plants to apply progressive technology, which leads to a reduction of production cost.

Third, most frequently the economic effect (profit) from the introduction of new development is received not by the enterprise that has introduced them, but by numerous consumers of the new products, which cannot be taken into account and for which it is impossible to obtain documents concerning the economic effectiveness. As a result, the scientists who have introduced the invention, as a rule, received many times less than is envisioned by the law. Nonetheless, because of scientific prestige they continued to create developments of national economic significance.

A design solution, in our effect, consists in having the economic effect determined by a competent agency under the All-Union Scientific Research State Patent expertise, and the author's honorarium would be paid out of a centralized source. Now, according to the law, the author's honorarium is paid only for the first million rubles in savings while it would be more logical to triple it for each subsequent million. To do this it is necessary to have an efficient economic mechanism which would make it possible to determine reliably the profit coming from the realization of inventions and discoveries and the amount of the deductions into the centralized source from enterprises and organizations that are utilizing the scientific developments. From this it would be possible to pay for the design according to the instructions of the State Committee for Science and Technology of experimental-production and industrial shops and installations according to the scientific and technical developments that have been accepted for introduction.

Academic institutes have a high scientific potential and can resolve fundamental and applied tasks skillfully and quickly. Thus, in our small laboratory, which has only 18 staff workers, there are three doctors and 12 candidates of sciences. In our developments industrial installations have been operating continuously for many years and they are now being introduced at four more points in the USSR (Dzerzhinsk, Navoi, Kazan and Kemerovo).

In his speech at the conference of the CPSU Central Committee concerning acceleration of scientific and technical progress in June 1985, general secretary of the party central committee, M. S. Gorbachev said that the scientific potential of academic institutes should be utilized by 100 percent and all obstacles raised by ministries and head institutes should be removed from their path. Immense possibilities of accelerating scientific and technical progress lie in efficient utilization of this potential.

FOOTNOTES

1. "Inventions: Breaking Down Barriers," IZVESTIYA, 4 January 1986.
2. Ibid.

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PRIORITIES OF ENTERPRISES EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 42-61

[Article by S. A. Timofeyev, candidate of economic sciences, NIPKTI of the Uralelektrotyazhmash Association (Sverdlovsk): "Where Does the System of Priorities Push the Enterprise"]

[Text] In connection with the changeover of the country's enterprises to the new conditions of management there has been a sharp increase in the significance of fulfilling contractual commitments that have been made. This was also emphasized at the 27th Party Congress. But practice shows that the target orientation of the enterprise does not always correspond to national economic interests. What do we have in mind?

An Old Ailment--Unfeasibility of Plans

Equating dynamity of the economic development of the enterprises with the growth rates of the indicators of the value volume frequently leads to the formation of excessively difficult planning assignments. The provisions of the economic experiment declared an expansion of the rights of the enterprises in the area of the formation of the production program. But in practice they can be realized only for increasing the planning assignments. Of the 21 enterprises of Sverdlovsk Oblast operating under the conditions of the experiment which we investigated, only one was taking advantage of the possibilities that had been granted. At the majority of them the planning assignments were either extremely difficult or too difficult. It was not without reason that in 1983, before the beginning of the experiment, about half (45 percent) of the enterprises in the country failed to fulfill their contractual commitments. On the one hand, this can, of course, be regarded as a result of inadequate responsibility on the part of their managers, but, on the other, it is evidence of the fact that excessively difficult plans are not such a rare phenomenon.

The major role in the formation of excessively difficult plans belongs to the existence of such a phenomenon as deficit in our economy. Without going into a scrupulous analysis of the causes of its appearance, or without having the possibility of influencing them, responsible workers frequently make arbitrary decisions when formulating larger assignments for increasing production

volume. These are most frequently based on a desire to raise the level of satisfaction of national economic needs. It is thought that the cause of the deficit is the lack of balance of the national economic plan. But this is more likely to be the effect than the cause. The existence of physical exchange among enterprises and the desire to maximize the value volume in combination with the expenditure method of price setting--these, in our opinion, are the main causes of the increased volume of resources requested by the enterprise, which also creates a shortage of them in the final analysis. This is also confirmed by the results of an investigation of enterprises of heavy machine building and the electrical equipment and machine tool branches of industry in Sverdlovsk Oblast. All enterprises, including those that fulfilled their planning assignments completely, indicated specific positions and volumes of material resources that were not completely allotted or not completely delivered.

An apparatus has been created in the branches which is intended to normalize and control expenditures and to plan a reduction of the expenditure of material resources. The effectiveness of this measure is minimal.

Practically nothing was changed by the introduction of the reduction of the maximum level of expenditures per 1 ruble of commodity output as a fund-forming indicator. And it could not change the situation, since the "over-ordered" resources are tied up, as a rule, in the circulating capital of the enterprises.

Thus achieving the major goal of the enterprise--maximization of the value volume--presupposes achieving a result with a minimum of its own expenditures and a maximum of expenditures from the outside. Expenditures from the outside summed up for all units of the national economy assume the form of national economic needs while internal expenditures assume the form of the plan. Under these conditions, when each enterprise is striving to increase the results of the activity of others that it consumes and to reduce its own, the deficit is just as inevitable as are the arbitrary decisions made in an attempt to eliminate it.

Excessively difficult planning assignments exist also because there are no methods for reliably evaluating the real capabilities of the enterprises. The interrelations that arise among enterprises and the higher organizations during the formation of plans frequently remind one of some kind of game without rules in which one side strives with all its might to reduce its capabilities, while the other side, knowing this, actively works in the opposite direction. An evaluation of the capabilities of the enterprises in terms of the handling capacity of the equipment without taking into account the provision of material and labor resources and without taking into account their withdrawal for the development of production is an anachronism whose preservation has a fatal effect on the dynamics of economic growth.

According to What Rules Are We Playing?

The results of the investigations we conducted show that at industrial enterprises there is a system of forms of achievement of the levels of volume

indicators required of them by methods that do not correspond to national economic interests. What do we have in mind?

In order to fulfill planning assignments with respect to volume indicators, the utilization of resources of subdivisions that are not included in the calculation of the production capacities. The objective basis for increasing the planning assignments in terms of the volume of production is the allotment of funds for expansion and technical reequipment. The existing methods of calculating the capacities of enterprises make it possible not to raise and not to resolve the issue of the correspondence between the amount of capital investments and the real capabilities of the branches and enterprises to realize them, that is, to transform them into additional production potential. The path taken (or that was forced upon) enterprises utilizing resources of auxiliary and service subdivisions in order to fulfill the production program led to the appearance of stockpiles of uninstalled and unutilized technical equipment. These enterprises were practically not in a condition to actively assimilate the new technological processes related to the application of the progressive specialized equipment. As a result, a vicious circle was formed. Not having the forces to develop production on the basis of the utilization of highly productive technical equipment, the managers of the enterprises were increasingly forced to enlist for fulfilling the production program resources of subdivisions that were called upon to provide for maintaining or increasing the production potential. That which at one time seemed to be a temporary decision became a system that tapped the roots of the development of production. The level of utilization of resources of instrument, testing, experimental and repair subdivisions in order to fulfill the plan changes depending on the specific conditions of the operation of the enterprises. But the very facts of their utilization for these purposes were registered in the majority of enterprises we investigated.

The "simplification" of production technology, that is, the reduction of the quality of products that are produced as compared to the levels envisioned by the GOST's and TU's. The forms of manifestation of this "method" which provide for the fulfillment of planning assignments in terms of volume indicators are various and specific for individual enterprises. It is impossible to judge the scope of its utilization from the number of complaints since under the conditions of a shortage the consumer enterprises rarely take advantage of the rights granted to them regarding this. It is precisely this latter circumstance, in combination with the connection of fines to the amount of profit (and not volume indicators) that makes the activity of the constantly expanding control and inspection staff, which is called upon to check on the maintenance of the quality level regulated by the TU's and GOST's, extremely ineffective. Naturally, the reduction of the quality is reflected in the growth of the demand. This, in turn, creates an additional shortage of products and also influences the formation of excessively difficult plans.

Raising the level of batch (series) output of products. This direction is basically typical of branches for initial processing of raw materials and the production of processed materials. The reduction of the time for adjusting rolling mills when the sizes of batches are increased undoubtedly leads to an increase in the indicators of the volume of production of rolled metal. But

in the sphere of consumption this "measure" requires increasing the volume of stockpiles for repeated work and insurance. Moreover, as calculations show, the stockpiles necessary for ensuring continuous work of the consumers must increase, in a number of cases, more rapidly than the volume of output of processed materials increases. The lack of a connection between evaluation indicators of the producer and the results of the utilization of the product by the consumer leads to a disparity between the evaluation of the degree of satisfaction of national economic needs and the real state of affairs. An increase in the indicators of volumes are raising the level of batch (series) output leads to a reduction of the rhythm of the work of the consumer enterprises. This, in turn, entails a number of negative phenomena which are reflected in the growth of the need for labor force and the impairment of the system of wages.

The distortion of statistical accountability. Such a deformed but real and frequently encountered phenomenon as write-ups of volume indicators is a reaction of the manufacturing enterprises to the excessive difficulty of the planning assignments. Write-ups have become possible only because there is a clear disparity between the evaluation of the volume and the actual degree of satisfaction of national economic needs. The battle against write-ups, as against the output of poor-quality products, can be effective only if one eliminates the bases that nourish these negative phenomena in our national economy. It must be noted that write-ups are only an element in the overall practice of distorting indicators that characterize the activity of the enterprises. As experience shows, practically all enterprises have distorted information concerning the level of fulfillment of output norms, the actual labor-intensiveness of the products that are produced, the quantity and level of overtime work, the coefficient of shift work of equipment, the coefficient of the utilization of production capacities and so forth. The possibilities of effective management of industry and their conditions of constant distortion of information obtained from lower-level management agencies are sharply reduced.

The creation of priority for "advantageous" items. The application of this "method," which provides, in combination with others, for the fulfillment of planning assignments, is implanted in the system of planning if there is a difference between the plant indicators of the value volume and the assignments for the products list which is calculated in value indicators. If the latter assignment exceeds the former, the manufacturing enterprise can divide orders into "advantageous" and "disadvantageous."

But what is the criterion for "advantageousness" of a product? One of the most widespread deceptions is that the different degrees of advantageousness of products produced by an enterprise are determined by the different degrees of profitability. From this clearly erroneous assumption follows the real economic policy in the area of stimulating the activity of enterprises. Through increasing profitability they have tried, for example, to stimulate machine-building enterprises to produce spare parts. This same principle (through compensation for expenditures) is used to construct the existing system of providing incentives for updating the products list and so forth. The results of these innovations are generally known. The machine-building enterprises, as before, regard spare parts as a disadvantageous product, in

spite of the fact that the level of their profitability is almost twice as high as that of finished products. The updating of the products list, even at the present time, is being carried out at rates that do not correspond to national economic interests.

The criterion for effectiveness that has taken form within the framework of the existing economic mechanism--the "advantageousness" of the product--from the standpoint of the interests of the producer, who determines the economic behavior of the enterprises, reflects primarily the increase in volume indicators and the possibility of realizing them under actual conditions (limitations on the basic kind of resource--labor). Therefore, the criterion becomes the ratio between the value characteristic of the product (price) and the labor-intensiveness of its manufacture or the labor-intensiveness in terms of limiting sections, for example, metal processing. This is precisely why spare parts practically always "lose out" to finished items, and newly assimilated products lose out to those that are in production. The large-scale economic experiment and the new conditions for management have made it difficult to give priority to advantageous items, but it has not destroyed this practice completely.

The attempt to reorient enterprises toward complete fulfillment of contractual commitments is being carried out under new conditions of management without making essential changes in the existing system of planning and management. The factors that condition the failure to fulfill the plan for deliveries have not been eliminated. It is not surprising that at a number of enterprises new forms are being created for achieving the necessary level of evaluation indicators without changing the style or quality of the work. With the existing methods for evaluating the level of fulfillment of contractual commitments, the enterprises can have satisfactory and sometimes even good indicators for fulfillment of the plan for deliveries while failing to fulfill the plan for producing the products that are sold. The basic volume of deliveries under agreements is simply shifted to the last quarter of the year. The work experience of enterprises of the Ministry of Heavy Machine Building and a number of enterprises of the Ministry of the Electrical Equipment Industry in Sverdlovsk Oblast in 1984 showed that this method can be used to report 100 percent fulfillment of contractual commitments for three quarters (9 months) and obtain the corresponding material benefits while the indicators are not satisfactorily fulfilled for the year as a whole. That is, the economic practice at the level of the enterprise is directly partially not toward improving production, but toward searching for forms of manipulating planning and report indicators that provide a positive evaluation of the work of the enterprise. There is no doubt that it is possible to improve the methods for evaluating the fulfillment of contractual commitments by introducing one more control and inspection level, but then there is no guarantee that complete fulfillment of agreements will not be achieved through even greater loading of auxiliary and service subdivisions with work from the basic activity or through further reduction of product quality.

Priority of National Economic Interests: How This Looks in Practice

The main reason for the situation that has been created, in our opinion, consists in that we have not yet created conditions for resolutely overcoming

the basic contradiction of the existing economic mechanism: we have not provided for priority and national economic interests. One can assert that any negative phenomenon that exists in our economy is directly or indirectly related to the fact that we are oriented everywhere toward obtaining the maximum intraeconomic results, and not the optimal national economic results. This is precisely what gives rise to departmental barriers, local interests, increased amounts of incomplete capital construction, and so forth. The substitution of the degree of satisfaction of national economic needs with the indicator of the growth rates of the value volume of production has led to a violation of the correspondence between quantitative and qualitative factors of economic growth. It is precisely the volumes that determine the prestige of the enterprises, the category for payment of engineering and technical personnel, and many other things. Moreover, business executives under the existing conditions do not have any other criterion for the flourishing of the enterprises they manage except the ever-increasing volumes of products that are produced. Under these conditions the volumes become necessary in and of themselves.

The question of the selection of the optimal ratio between quantitative and qualitative growth factors is the most important and decisive one when solving the problem of improving the economic mechanism. We need volumes, but optimal volumes. One of the directions for intensification, in our opinion, could be a changeover in a number of branches to technologies that make it possible not to increase, but to reduce production volumes as a result of improving product quality. In particular, this problem is clearly crucial in ferrous metallurgy. But this approach to considering the variants of economic development which are oriented toward increasing not the immediate, but the final product, becomes possible when making not partial, but radical changes in the economic mechanism which has taken form under complex conditions of the development of our economy.

The basis of the large-scale economic experiment--the development of the conditions that provide for a complete fulfillment of contractual commitments --forms the first weak, but still real element of the economic mechanism which is called upon to provide for priority of national economic interests over private and group interests. Therefore the basic results of raising the level of contractual discipline at enterprises participating in the experiment, in the event that this has actually been achieved, were experienced by enterprises of the consumer branches. Here in the first stages the growth of the national economic results can be accompanied by the deterioration of the indicators of intraeconomic activity of the enterprises that have been changed over to the new conditions of management. An understanding of this fact is extremely important for a correct evaluation of the results of the experiment and a determination of ways of further developing and deepening it.

New Conditions and Scientific and Technical Progress

The basic contradiction we have considered is manifested most critically in the sphere of the development of scientific and technical progress. Enterprises mainly use the funds placed at their disposal for fulfilling assignments for the production of previously assimilated products, frequently to the detriment of the fulfillment of the plans for new technical equipment.

The changeover to the production of newly assimilated products forms a tendency toward a reduction of volume indicators of production and labor productivity. But previously assimilated products provide for a greater value volume per unit of working time expended than new ones do and therefore they are more advantageous to a production that is oriented toward increasing volume indicators. This takes place because the price of the item is practically a stable amount while the labor-intensiveness is constantly decreasing.

The ratio between the value and the labor-intensiveness of the production of a new item, as a rule, is considerably less than for the analogue that is replaced. The changeover to a new product more or less returns this ratio to its initial level.

An analysis we conducted shows that deviations in the levels of the ratio between price and labor intensiveness during the period of assimilation of products are extremely insignificant, while the deviation of this indicator for newly assimilated items as compared to those that are being replaced in certain cases reaches 300 percent and more. Thus the institute of the Uralelektrotyazhmash Association developed a new high-voltage, low-lubrication switch which provides for saving 4.6 tons of rolled ferrous metals, 6 tons of transformer oil and 0.5 kilograms of silver. The price of the new item is lower than the price of its analogue. But if the manufacturing plant were to change over to the production of the new product during the course of a year, having completely removed the previously produced product, its volume indicators in terms of commodity output would decrease by 7.5 million rubles. The production of the "old" product provided for 17 rubles of volume per 1 norm hour, while the "new" one would provide only 5. And this, unfortunately, is far from the only example. Calculations done for enterprises of the Ministry of the Electrical Equipment Industry and the Ministry of the Automotive Industry show that the proportional value indicators per 1 norm hour of labor-intensiveness when changing over to new products decrease by an average of 40 percent.

The absence in real practice of particular cases of a sharp reduction of volume indicators of production when changing over to new products is explained by the existence of a "system" of compensation for the influence of updating the products list for the volume of production. The first element in this "system" is an increase in prices for the new products. This is achieved basically as a result of increasing the labor-intensiveness and material-intensiveness, which subsequently enables the enterprises to provide for the achievement of the indicators planned for them for increasing labor productivity and reducing production costs as a result of the utilization of supplies that have been stored up during the stage of assimilation of the product. It is difficult to imagine a stronger form of suppression of stimuli to improve technology. More typical in this respect is the state of affairs in assembly shops of machine-building enterprises. Everywhere labor productivity in these subdivisions increases while the technology that is applied remains unchanged.

The possibility of providing for an "increase" in productivity and a "reduction" of production cost without changing the technological level of

production has brought into existence a system of directive planning of new technology. Regulation "from above" of the quantity of machine tools with numerical program control, automated lines, robots and so forth that are to be put into production shows once again the lack of a deep economic interest in improving technology on the part of the enterprises.

The existing "expenditure" method of price setting creates conditions whereby the enterprises, by increasing expenditures during the period of assimilation of a new product, imitate intensification of production by bringing them up to the actually necessary level. As an illustration, let us give the figures for the change in the level of wholesale prices of items of high-voltage equipment included in the price list 15-03 in 1981-1984, during an expert evaluation conducted in the branch institute of the Ministry of the Electrical Equipment Industry (the NIPKTI of the Uralelektrotyazhmash PO) and the USSR State Committee for Prices. We shall take the levels of the plans for wholesale prices submitted by 65 enterprises of eight ministries as 100 percent. In this case the plans of the branch scientific research institutes amount to 94.5 percent, and the established prices are 92.3 percent.

It should be noted that the increased plans for wholesale prices revealed during the expert evaluation is only the tip of the iceberg. A more essential element of the "system" under consideration is the prolongation of the process of assimilating new kinds of items. In addition to the fact that all this is clearly in contradiction to the national economic interests, the utilization of the "system" in the final analysis has a negative effect on the internal condition of the enterprises as well. In addition to the already mentioned suppression of stimuli for improving production technology, attention should be drawn to the formation of disproportions in production when there is a prolongation of the process of updating the products list. The slow, prolonged dissemination of new kinds of products reminds one of a prolonged illness. Restructuring under these conditions becomes one of the current problems. A production that produces products in insignificant volumes seems to "burst" when the production is increased significantly and "bottlenecks" are formed in several technological sections at the same time.

Attention should also be drawn to the existing practice of financing work for technical reequipment of enterprises, which is oriented toward increasing volume indicators. The enterprises "find" funds for reequipment of production in order to update the products list in capital investments which are used for the startup of new capacities. Here a mandatory condition for the allotment of capital investments is met--the capacities increase, to be sure, most frequently only on paper.

The orientation of industrial enterprises toward maximum intrabusiness results in their activity--a reduction of production costs and increased productivity --has created a situation wherein the enterprises are not interested in delivering to production items with a high level of technology. Let us explain this situation. When introducing a new technology that provides for the production of parts with a reduced production cost the enterprise obtains a cost-accounting savings only if these parts are used for batching items which have been assimilated before the time of the introduction of the new technological process. In the event that these same parts are used for

batching items that were assimilated after the new process was introduced, the enterprise has no savings since the reduction of the production cost is "extinguished" in expenditures on the production of the new item. The national economy experiences this savings in the form of a lower cost of the new item, but the basic evaluation indicators of the manufacturing enterprise are not improved because of this. Moreover, the enterprise that has assimilated the item with high technology will be in relatively more difficult conditions for the fulfillment of assignments for reducing production costs as compared to its colleagues.

The negative influence of the introduction of the achievements of scientific and technical progress on the evaluation indicators of intraproduction activity is not compensated for by the system of measures for stimulating scientific and technical progress at the level of the enterprise. Suffice it to note that the funds for bonuses for the creation and introduction of new technical equipment in industry comprised about 4 percent [Footnote 1] of the material incentive fund. In the electrical equipment industry this amount is 8.7 percent.

The economic experiment has made the following basic changes in the system of planning and stimulation of scientific and technical progress: items of new technical equipment are partially included in the delivery plans for industrial enterprises; funds are being created for the development of science and technology at industrial enterprises; bonuses for the management of the enterprise are linked to new technical equipment and the basic results of their activity. The realization of these points could be regarded as an effective measure if at the same time the objective obstacles we have considered were removed from the path of scientific and technical progress.

On the whole, in our opinion, there is a grain of reason in the new approach to problems of scientific and technical progress. The first, although still insignificant, step has been taken in the direction of merging to currently separate systems of planning and stimulation which exist in parallel at industrial enterprises: basic activity and new technical equipment. The very fact of the existence of the two systems shows the contradictory nature of the goals set for the enterprise. If the goals of the development of the basic activity and the assimilation of new technical equipment converge, there is no longer a need for the existence of two systems either. Movement in this direction has begun. There has been a tendency toward merging in planning (through the inclusion of items of new technical equipment in the planned volume of orders) and stimulation (so far, at the level of the management of enterprises). This tendency should be strengthened and developed.

What Are Wages Paid For?

A fundamental issue in optimization of the system of wages in industry is the achievement of the maximum possible correspondence between the growth of the wage fund and the growth of the result of the activity of the enterprise as evaluated from national economic positions. It was pointed out above that the basic indicators applied under the conditions of the experiment for evaluating the work of enterprises, which are at the same time indicators used when determining the planned wage fund, do not reflect the national economic aspect

of the results of the activity of the enterprises. The change in the amount of the actually utilized wage fund is also poorly coordinated with the changes in the indicators used for evaluating the production activity. This situation is explained by a number of circumstances.

The methodological separation of the formation of the calculated and the actual wage fund. These are done by quite different methods and therefore their amounts, as a rule, do not coincide. The calculated wage fund, which includes the wage fund and the unified fund for material and incentives, is determined as the totality of indicators characterizing the result of the activity of the enterprises, utilizing normatives and applying limiting conditions.

The constant part of the actual fund: from direct evaluations, depending on the volume of work performed (piece rate workers) or the amount of time worked (time rate workers, engineering and technical personnel, employees); the variable part (bonuses): for workers--according to the bonus provisions, depending on the individual or brigade indicators, and for engineering and technical personnel and employees--according to bonus provisions, depending on the amount of the indicators of the operation of the enterprise, adjusted (in the direction of reduction) with individual work indicators.

Thus with the formation of the main (about 95 percent in the electrical equipment industry) part of the actual wage fund not only the results that are achieved, but also the indicators of the activity of the enterprises (which, unfortunately, are far from the same thing) are ignored. A situation is created in which the majority of workers of the enterprise are not materially motivated to achieve the planned indicators of its activity. They are interested only in maximizing personal (brigade) results. This problem, which arose a fairly long time ago, was aggravated to a significant degree while the experiment was being conducted and under the new conditions of management.

The orientation toward a concrete order requires increased mobility of production in the work positions. There are more times of restructuring and readjustment because of the changeover from one product to another. The new requirements stand in contradiction to the interests of the piece-rate workers (the desire to maximize the batch of process parts since a maximum batch provides a minimum proportion of preparation and startup time and, as a result, an increase in the individual result, and therefore also an increase in direct earnings).

The introduction of the assignment for fulfillment of the assortment (or analogous ones) as the basic indicator for calculating bonuses for workers and brigades encounters resistance since maintaining the previous level of earnings requires additional efforts from the immediate producers. The result was the creation in many of the enterprises that were investigated of bonus provisions for workers and brigades in which the new indicator is introduced only in addition to the traditional ones, which take into account the fulfillment of the assignment in terms of volume measured in tons, norm-hours and so forth.

Conducting the experiment reveals another contradiction that is inherent in the existing system of wages. The practically complete lack of a connection between the level of wages of workers and the evaluation indicators of the activity of the enterprise leads in practice to a situation where, in a number of cases the increase in wages as a result of a deterioration of the conditions for the work of the enterprises. This is manifested most clearly with a deterioration of the indicator of rhythmic work. At many enterprises the additional payments for overtime work and for working on days off have become a stable form of increasing wages. In our opinion, this situation is one of the most essential obstacles on the path to providing for rhythmic operation of the enterprises, without which complete and, the main thing, stable fulfillment of contractual commitments is impossible.

The negative phenomena we have considered are reflected also in the wages of engineering and technical personnel. The standard bonus provisions, as before, link the amount and the very fact of obtaining bonus remunerations for this category of workers to the basic evaluation indicators of the work of the enterprise as a whole. The impossibility of exerting a practical influence on the amount of these indicators by each individual engineering and technical worker leads to a situation where engineering and technical personnel expect bonuses but do not work for them. The bonuses regarded as a result of coincidence, which they are unable to influence. The systems of bonuses for engineering and technical personnel and workers, according to the methodology for constructing them, are diametrically opposed. In one there is a complete lack of connection to the indicators for evaluating the work of the enterprise, and in the other the bonus is completely conditioned by these indicators. Both the one and the other variant contain essential shortcomings.

The lack of a calculated (scientific) substantiation of the normative base applied when planning the wage fund. The basic method for determining the normatives for the formation of the wage fund and the material incentive fund is the method of selection. Its groundlessness is manifested in the instability of the normatives, since their application in practice leads to the formation, in a number of cases, of funds whose amounts do not fall within reasonable limits. The stabilization of the normatives that is achieved under the conditions of the experiment is not linked to the higher level of their substantiation and is determined by the fact that the normatives are utilized, as distinct from the previous practice, for determining the deviations of the funds from their amounts that had been formed in the preceding period. This approach to the formation of the wage fund has reinforced the negative phenomena and made them irreversible by nature.

The violation of the correspondence between the labor contribution and the amount of wages. This was noticed even before the experiment was conducted and was not eliminated by its conditions. The lack of rhythm in the work of the majority of enterprises of a number of branches, and above all machine building, led to the need to retain a larger number of workers than necessary in the finishing stages of the technological process. In practically all of the machine-building enterprises that were investigated there was a surplus number of assembly workers. It was precisely this circumstance in combination with the work force that made it necessary to maintain for this category of

workers a level of wages that exceeded their actual labor contribution. Through the natural averaging of the level of wages, with a free movement of the work force, this negative phenomenon spread to other categories of workers and enterprises of other branches of industry. In reality this process was reflected in the deterioration of the ratio between the growth rates of wages and the growth rates of labor productivity in industry.

The Goal--A Unity of Goals

The elimination of the negative phenomena we have considered, including the contradictoriness of the target orientation at the level of the enterprises, requires a radical restructuring of the existing economic mechanism. As was stated in the political report to the 22nd Party Congress, "economic management, and this is obvious, is in need of constant improvement. But now the situation is such that one cannot be limited to partial improvements--a radical reform is needed. Its point is in reality to subordinate all of our production to social needs and the satisfaction of the needs of the people, to direct management toward increasing the effectiveness and improving the quality, accelerating scientific and technical progress, and developing interest on the part of the workers in the results of labor, initiative and socialist enterprisingness in each unit of the national economy, and above all in the labor collectives." It is impossible to reach a solution to the problems facing the economy through cosmetic repair of the existing system of management. The approach we have developed is based on the possibility of limiting the sphere of the expenditure system of price setting, which disorganizes our economy. The enterprises are given compensation for the actual production cost of the products that are produced at a level no higher than the base expenditures. The proportionality of the development of the national economy is maintained by observing, in the first place, the correspondence between the amount of the wage fund and the sum of values of newly created objects of consumption. An increase in production capital under the conditions considered here takes place with restitution. An increase in capital as accompanied by a reduction in the amount of expenditures for which the enterprise is compensated. The amount of this reduction is determined depending on the amount of the increase in capital according to the normative.

The introduction into practice of the principle of restitution for the increase in funds leads to the creation of objective conditions that provide for the formation of an optimal, economical demand for resources. Obtaining additional resources will be justified only if their utilization leads to a reduction of expenditures on an amount greater than that established by the normative. Under these conditions the main problem is not supply, but sales. The center of gravity and planning shifts to the sphere of development through the creation of new productions and optimization of the structure of the national economy. An increase in the normative becomes the sphere of contractual relations among enterprises. The interest of the consumer enterprises in utilizing new, highly effective technical equipment and progressive materials, like the interest of the producers in accelerated mass production, ensue from the plan for forming the wage fund of the collective of the enterprise according to which the distribution according to labor begins after the satisfaction of the most important social needs. [Footnote 2]

The source of the increase in individual earnings should be the reduction of the social expenditures of production, since there simply is no other source under the proposed conditions.

A change in the form of socialist management leads to a leveling of the significance of intermediate results which are evaluated at the present time by the system of indicators whose quality is constantly being criticized. It is difficult to interest the society in increasing labor productivity, improving product quality, perfecting the organization of production and reducing material-intensiveness if this is not realized in the final result--a reduction of expenditures compensated for by the society when producing products or utilizing them. Another, no less valuable circumstance can be the possibility of creating an organic system that does not require a cumbersome control and inspection apparatus as a result of natural alignment of social and individual (group) interests.

FOOTNOTES

1. Yakovets, Yu., "The Economic Mechanism for Assimilating Principally New Technical Equipment," VOPROSY EKONOMIKI, No 6, 1982.
2. See Marx, K., Engels, F., "Soch." [Works], Vol 19, p 17.

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DISCIPLINE IN CREATIVE WORK DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 62-71

[Article by V. I. Nikitinskiy, doctor of jurisprudence, All-Union Scientific Research Institute of Soviet Legislation, and L. V. Nikitinskiy, candidate of jurisprudence, VGIK, Moscow): "Archimedes' Work Day"]

[Text] The Basic Directions for the Economic and Social Development of the USSR During 1986-1990 and the Period Up to the Year 2000 attach key significance to science as a real productive force of the society. One of the internal reserves of science which makes it possible to increase its potential and which does not require additional material investments is improvement of the organization of scientific activity and strengthening of the responsibility and discipline of the scientists. But the very concept of discipline has a specific meaning here, and the success of the management of science depends on an understanding of this.

There is a story about a military serviceman who said: "If you civilians are so smart, why do you not walk in formation?" This story has a double meaning. Civilians, who have become accustomed to freedom of action, consider walking in formation and other attributes of military discipline to be absurd--that is the first meaning. And here is the second: anyone who laughs at a military formation is foolish himself. Under army conditions, formation is not an absurdity, but a tested means of strengthening military discipline. And stupidity begins where and when disciplinary methods that are suitable in one sphere of activity are mechanically transferred to other conditions that are not at all similar. Discipline is multifaceted. It is one thing on an assembly conveyor and something altogether different in a scientific research institute.

The more closely the work process is linked to individual creativity, the broader should be the framework of personal freedom and the variability of behavior: "Formation" is unacceptable here, labor can be evaluated only in terms of the final results, and not in terms of partial criteria such as whether the researcher spent 5 or 7 hours at work. On the other hand, in a modern scientific organization it is difficult to exaggerate the significance of order, and sometimes it is beyond compare, even with the most rigid conveyor. A person may come to the laboratory in a state of confusion and not

be thinking about the experiment. One incorrectly pushed button can lead to the destruction of many years of work or can burn up equipment worth millions of dollars.

A combination of profound individual creativity and strict collective discipline dictates the need to take an individual approach to problems of working conditions and discipline for scientists. The Basic Directions require that we apply more expensively new, progressive forms of organization of scientific activity. It seems to us that within the framework of these progressive forms it is necessary to devote attention particularly to non-traditional working conditions and recreation for scientific workers.

Illumination and Routine

The word "discovery" somehow in and of itself reminds one of Archimedes. There he is, disorganized, like all geniuses, having forgotten to take off his boots, lying in the bath and suddenly: Bang!--Eureka! "Bang!" really makes an impression. Popularizers and authors of biographies of outstanding scientists (nobody writes about those that are not outstanding) also make a lot of this. Therefore people who know the lives of outstanding scientists from books (and these are the majority) have a better idea of the idle facade of this knowledge than they do of what takes place inside.

Along with those of Archimedes, one can name a whole number of great discoveries that were made during nonworking time in an "unsuitable" situation. The binocular microscope was invented by S. Wentham while reading a detective novel. According to his own words, Albert Einstein, one morning, having had a good sleep, sat up in his bed and suddenly understood that time depends on the condition of the system of reckoning. If that evil little alarm clock--the companion of the majority of modern workers in scientific research institutes--had awakened the scientist a half hour earlier, who knows, the theory of relativity could have been discovered later and by somebody else. To say nothing of Mendeleev, who saw all of his periodic table in a dream. [Footnote 1]

But still the idea of science as a chain of striking sudden visions is very one-sided. It leaves in the shadows that immense amount of tiring work which preceded the "insight." And what is especially important for us is that this work most frequently was not done by the discoverers in isolation. The merit of the genius is that he has seen and clearly formulated a solution before his colleagues, who are legion. But without their joint efforts he never would have arrived at the result which to the naive reader of a popular brochure seems to be individual. The further science develops, the more appreciable this collectivism in the creativity of scientists becomes.

"I am especially happy that I did not have to spend long years as one of the screws in a modern scientific factory, do what was ordered, and work on problems set by the management," wrote the founder of cybernetics, Norbert Wiener. "With all my heart I feel sorry for modern young scientists, many of whom, whether they like it or not, are doomed because of the spirit of the time to serve as individual lackeys or time card punchers who mark down the time when they arrive and leave work." [Footnote 2]

Elimination is an important, perhaps even the most important, moment of scientific creativity. It is not available to everyone (no offense intended) and those it selects it certainly does not visit every day: for some it is once a year and for some it is once in a lifetime. But the main thing is that nobody, including the researcher himself, knows when he will be "struck" and what is necessary for this. There are developments of psychologists concerning the most favorable conditions for creativity, like "hothouses of ideas" but they are too individual for each scientist, and it is simply impossible to create these "hothouses" everywhere, in all scientific institutions. Even if one could imagine a scientific research institute in which each scientist is assigned his own office with a couch, a coffee pot and a typist, even under these conditions there is no guarantee that this would appreciably increase the output of valuable ideas. Moreover, the workers would probably never leave this institute at all. In practice, the conditions in the majority of scientific institutions are extremely far from "hothouse" conditions: it is crowded, they do not have the necessary literature, and it is impossible to concentrate. The chances of discovery in these situations are minimal. Even if an idea is following on a scientist's heels, it will most likely catch up with him in some other place.

Thus perhaps we should turn the research scientist "loose"? Why should he spend all day listening to others' telephone conversations? But let us recall that minutes of illumination, with all of their unparalleled importance for scientific and technical progress, take up some negligible, unregistered part of the overall volume of time of the scientist. All the rest of it are ordinary days for preparing the soil on which an idea should sprout (if it is going to sprout at all). This everyday work is formed out of a multitude of cycles: the formulation and interpretation of the problem, the selection and accumulation of information, the "reading" of themes, the conducting of experiments, the gathering of materials "in the field," the "digestion" of the materials, the formulation of the results and the preparation of these for publication. All this is accompanied by a mass of purely technical, boring, but necessary actions like drawing up plans or reading proofs. Many of these kinds of activity can take place only within the walls of scientific research institutes, within the framework of the general conditions established for the institute and its services. Here the scientists must communicate with one another, conduct seminars, conferences and discussions, in brief--collectively eat up the next pie of information. But there are also cycles of scientific labor which, as practice shows, can take place most successfully outside the institute, and not only "in the field" or in the library, but even at home at one's own desk, while taking a walk, or in general wherever seemed suitable, at the discretion of the scientist.

Is it expedient to permit scientists freedom from regimen and if so, which ones and within which limits? This question should be answered first of all by experts in science on the basis of the study of the time budgets of scientific workers and a comparison of the effectiveness of concrete cycles of their scientific activity within the walls of scientific research institutes and outside them.

Here is what is written about this by the well-known science expert G. N. Volkov: "The work of a scientist does not submit to regulation of time. The process of scientific searching cannot be crowded within the framework of a working day.... The scientist continues to work consciously or subconsciously on a problem that is bothering him while he is at dinner, in the theater or even while he is sleeping.... For scientific creativity there is not and there cannot be any socially necessary working time. Scientific creativity, despite its social nature and the fact that it can assume the form of collective creativity, in its essence is always individual." [Footnote 3] According to the data of I. V. Sergeyeva, who interviewed many modern scientists, it turns out that the best results were obtained by them outside the institute. This same I. V. Sergeyeva, on the basis of experimental research, came to the conclusion that increasing control over the activity of scientists on the part of management, particularly paying more attention to certain aspects of their work and trivial matters, inevitably reduces the productivity of their labor, which can drop to a minimum. [Footnote 4]

Many other science experts, sociologists and legal experts have written about the fact that the labor of the scientist takes place during nonworking time and its conditions require special regulation. Especially interesting, in particular, are the data of V. G. Fomin to the effect that after all workers and employees were changed from an 8-hour to a 7-hour working day, the overall time expenditures of the scientists on scientific work did not decrease. [Footnote 5]

And here is what is written in the Charter of Scientific Workers which is approved at the first general assembly of the World Federation of Scientific Workers (WFSR): "Working time and days off for scientific workers should not be strictly regulated." And further: "If scientific workers are put in the same position as administrative or trade employees, their work can be reduced to naught...."

In the Declaration of the Rights of Scientific Workers," adopted by the WFSW in April 1969 [Footnote 6] it is noted that "because of the value and importance both of scientific research and pedagogical work of scientists, it should be carried out under favorable conditions and be organized in such a way that the time and energy of scientists are not spent in vain." In the recommendations concerning the status of scientific workers adopted by the UNESCO General Conference in November 1974 [Footnote 7], it is also emphasized that the conditions for the work of scientific workers should be formulated and interpreted "with all reasonable flexibility."

And so there are many arguments in favor of special conditions for the working time of scientific workers. Is this circumstance taken into account in labor legislation and in actual practice?

The Law and Practice

The practice of granting workers so-called library days has long been firmly established in many scientific institutes. The majority of scientific workers are absolutely convinced that they have an unshakeable right to work outside their scientific research institute once or twice a week, and their obligation

to appear at work is limited to two or three "reporting" or "attendance" days. If you say that this is not the case many of them will begin to argue and will even try to find a confirmation of their right in legislation. And, of course, they will not find it. The only norm concerning the issue that interests us here is contained in the decree of the SNK SSSR of 6 January 1941 [Footnote 8], whose existence, in principle, is known only to narrow specialists. According to this decree, managers of ministries and departments (but by no means directors of institutes and certainly not managers of their subdivisions) are permitted to wave the registration of arrival and departure from work in scientific research institutes of academicians and individual scientific leaders who have the scholarly title of professor or the scholarly degree of doctor of sciences; thus they are granted the right to conduct scientific work outside the institution. Our current large army of candidates of sciences, not to mention scientific associates who do not have a scholarly degree, are not included in this permission. The more so since they take advantage of the notorious "library" days.

Legal experts are well aware that any time one law or another turns out to be imperfect, does not take into account the socioeconomic requirements of the society or the specific nature of individual kinds of labor, it simply ceases to be observed or is observed exclusively "under the whip." At the same time real practice develops its own unwritten rules which are quite reasonable, but which are not written into the existing legal system. Those "library days" owe their appearance to the wiser managers of scientific institutions, as a rule, outstanding scientists, who, understanding well the specific nature of the given kind of activity, have resorted and continue to resort to deliberate violation of legislation, covering with the force of their own authority the frequent absence of the most valuable workers. It is known, for example, that the director of the Leningrad Physics and Technical Institute, Academician A. F. Ioffe fired his deputy because while he was absent the deputy tried to organize the work of scientific workers strictly from 9 to 5. [Footnote 9]

But the levels above the scientific research institute (the staff of the USSR Academy of Sciences, the corresponding ministries and departments which have jurisdiction over the scientific research institute) periodically get up in arms about the practice of granting library days, which bothers them. Without completely understanding the specific nature of scientific labor, and sometimes even envying the privileges of scientists (for example, extended vacations), the staff workers from time to time try to "put pressure on" the scientists and impose in scientific research institutes discipline in the sense in which they themselves understand it. Of course, to exercise control over the work of institutes under their jurisdiction through unwavering observance of 9 to 5 working conditions in them is considerably simpler than to study and evaluate the real results of scientific creativity.

During inspections the existing conditions for work in scientific research institutes are interrupted, since the object of inspection is frequently not so much the essence as the appearance of the observance of external discipline. There is confusion and mutual animosity which in no way contributes to a normal creative situation. Of course with orders and reprimands it is possible to make sure that all workers spend the required hours and minutes in their work positions. But what will this produce except

for the squabbling and departure of the most valuable personnel? For freedom of movement is regarded by scientists, on the one hand, as a necessary condition for fruitful work, and, on the other, as an honorable, earned privilege, an encroachment on which they regard as a personal insult.

The position of the USSR Academy of Sciences, which until recently has half-heartedly supported the "library days," remains extremely ambiguous. On the one hand, scientists understand scientists and do not wish to cut off the branches on which they are sitting. On the other hand, the presidium of the academy does not wish to take responsibility for changing existing legislation, especially in a situation of increased demandingness for labor discipline and the observance of law and order. The result of the effect of these two contradictory tendencies was the instruction of the Presidium of the USSR Academy of Sciences of 9 July 1985. We quote: "A considerable category of workers of scientific research institutions unjustifiably take advantage of so-called creative and library days, there is no proper policy for granting these days, and the proper control over their utilization has not been organized...." So are they allowed or not? The unassertive document cited here not only does not bring clarity to this issue, but completely confuses the formal aspect of the matter. In essence, the academy is approving of letting things go as they will. But what else should it do?...

What Should the Solution Be?

Our country has now taken a more flexible and profound view of discipline, which keeps in mind first of all the final result of the work and not the mechanical "from 9 to 5." This can be seen not only in science, but also in other spheres of labor activity. In particular there is a search for new forms of application of legislation concerning working time and recreation time. Numerous experiments during the course of which flexible work schedules have been tested in institutions and organizations culminated with the decree of the USSR State Committee for Labor and Social Problems and the AUCCTU of 30 May 1985 which established the "Recommendations for the Application of Flexible Work Schedules at Enterprises, Institutions and Organizations of Branches of the National Economy." These conditions can be introduced into any organization by the administration in conjunction with the trade union committee upon individual and collective requests from the workers. They can apply to the entire collective, collectives of individual subdivisions or even two individual workers. The essence of flexible working time consists in that in addition to "fixed time," when all workers must be in their work positions, there is "variable time" at the beginning and end of the work day, within whose limits the workers can begin and end their work at their own discretion.

The application of flexible schedules could significantly improve the atmosphere in scientific research institutes and in principle there are no obstacles to this at the present time. But it should be emphasized that while allowing workers to vary the beginning and end of their working day within certain limits according to their own convenience and individual inclinations, flexible schedules are still based on the need for their presence in their work positions throughout the entire working time, that is, 41 hours a week. This does not solve the problems we have raised, which derive from the specific nature of scientific labor. We are proceeding from the fact that

presence at work sometimes takes away time from actual scientific labor which is carried on outside the scientific research institute.

The nature of scientific labor makes it different from many other kinds of socially useful activity. Even with the most modern methods of planning science scientific labor retains the peculiarities of creative spiritual activity, like the labor of a writer, a composer or an artist. The optimal form of organization of labor of so-called creative workers was found long ago: it is generally not constrained by the bonds of any internal order. The disciplining role for them is played by the author's agreement, which is directed toward the final result of labor, but does not restrict the author to means, devices or a schedule for creating a work. But the utilization of this model for legal regulation of the conditions for the working time of scientists is made difficult by the fact that many cycles of scientific activity can be successfully carried out only in scientific research institutes and only in a strictly determined time period and collectively. People are now suggesting such a new form of scientific work as the creation of interinstitution comprehensive brigades of scientists for "shock work" on a certain scale for scientific problems. Here, it would seem, it would be possible to borrow something from the author's agreement on the level of organization and payment for labor. But with ordinary work in the rank-and-file scientific institution this is hardly acceptable.

It is extremely difficult to monitor the conscientiousness of the labor of a scientist because the truly inspired discoverer, in terms of objective indicators and reports, can for a long time appear to be worse than someone who does nothing but has adapted to the situation. A. Ampere formulated the theory of electrodynamics in 2 weeks. Is this fast? Extremely! But before this he thought for 20 years without bringing up any results for view. Just try to figure out whether he was actually thinking for 20 years or was just acting as though he were. And if he was thinking, what has come of this? The report is also an indicator that is not always adequate. M. Borne, one of the fathers of quantum mechanics, explained: "My work method consists in that I try to express that which I essentially cannot express, for I do not yet understand it myself." It is quite clear that with such a method the Nobel Prize winner could hardly write an acceptable report, and any skillful do-nothing could produce what would seem to be much more.

For us there is no doubt that at the present time in science there are many time servers or simply ungifted young (and not so young) specialists. To be regarded as a scientist is prestigious, it is clean work, the earnings, to be sure, leave something to be desired right now, but there is free time and energy which the time-server can turn into material values. It is impossible to grant such "scientists" complete "freedom of creativity" for they will begin to use this freedom for other than its intended purpose.

But still it seems to us that we must rely more on the conscience of the scientist while at the same time increasing his responsibility for the final result of his work. There simply is no other way for normal organization of scientific activity.

It is impossible to take into account in a centralized legislative act the specific nature of various branches of science, the profiles of scientific institutions and the nature of research that is being conducted (theoretical, applied) the official duties of various categories of scientific workers, not to mention the individual peculiarities and the creative potential of each individual scientist. On the basis of this, in our opinion, one should grant general legal permission for the application of free work schedules and determine who will be responsible for resolving these problems. Managers in science, under their personal responsibility, should be granted the legal and not the unofficial opportunity to determine the working conditions for each specific worker. Then one of them might be permitted to have a flexible work schedule while another can have "library days," and a third might not be permitted to work outside the institute at all except for mandatory reports. An intelligent and conscientious scientist knows for himself when he needs to be at the institute in order to succeed and when it is better to remain at home. And for those workers who deserve confidence, no exceptions should be established to the generally accepted conditions.

By introducing these kinds of provisions in scientific institutions we would not only solve many problems of organizing the labor of scientists, but would also create a powerful new apparatus for stimulating conscientious and highly productive work. A system of regulating the conditions for work in a scientific research institute which is constructed on the principles we have proposed should be coordinated with the reform of wages of science which has long been under way and the new gradation of duties of scientific workers. In order to preclude subjectivism and personal predilections when establishing individual working conditions, perhaps one should provide for the participation of labor collectives and organizations in the solutions to these problems.

The implementation of our proposal does not require of the experiments that are fashionable at the present time. "Experiments" have been conducted long ago and the system has been proven by practice. All we are essentially suggesting is legalizing and ordering those relations which have been in effect for many years in our truly creative collectives.

FOOTNOTES

1. See, for example: Sukhotin, A., "Paradoksy nauki" [Paradoxes of Science], Moscow, 1978.
2. Wiener, N., "Ya--Matematik" [I Am a Mathematician], Moscow, 1964, p 343.
3. Volkov, G. N., "Sotsiologiya nauki. Sotsiologicheskiye ocherki nauchno-tekhnicheskoy deyatel'nosti" [The Sociology of Science. Sociological Sketches of Scientific and Technical Activity], Moscow, 1968, p 112.
4. Sergeyeva, I. V., "Social Problems of Scientific Creativity," author's abstract of candidate's dissertation, Moscow, 1970.
5. Fomin, V. G., "Byudzhety vremeni nauchnogo rabotnika" [The Time Budget of a Scientific Worker], Novosibirsk, 1967, p 61.

6. MIR NAUKI, No 4, 1969.

7. Ibid., No 2, 1975.

8. SP SSSR, No 2, 1941, p 37.

9. Dorofeyeva, V., Dorofeyev, V., "Sto let voskhozhdeniya. Istoricheskoye povestvovaniye" [One Hundred Years of Ascent. A Historical Narrative], Moscow, 1983, p 81.

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CSO: 1820/32

SIGNIFICANCE OF INFORMATION IN MANAGEMENT STRESSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 72-79

[Article by Yu. P. Sosin, laboratory chief for economic research of the Krasnoyarsk Engineering Construction Institute: "Information for Management"]

[Text] Information "performs in management the same function as headlights do for a driver at night. The headlights light the road ahead, but do not eliminate the need for correct decisions."

J. O'Shaughnessy
"Principles of Organization of
Management of a Firm," Moscow,
"Progress," 1979

The All-Union Conference in the CPSU Central Committee in June 1985 concerning questions of accelerating scientific and technical progress the situation that has taken form in Krasnoyarsk Kray was characterized critically. "During the past two five-year plans," emphasized M. S. Gorbachev, "gigantic amounts of money have been invested in the kray--23 billion rubles. But dozens of enterprises and electric power stations have not been fully constructed, and the expenditures are not producing the proper return." This is related mainly to the mistakes in the structural and investment policy. A critical shortage of housing, children's preschool institutions and so forth was reflected in the migratory turnover of the population, the fact that new settlers did not establish permanent homes, the labor turnover and labor discipline, especially in construction. A good deal of the responsibility for the situation that has arisen belongs to the kray planning commission and the statistical administration which did not promptly submit to directive agencies of the kray and the USSR Gosplan information concerning the problem that was developing and the consequences that were to arise. The payment for these mistakes has been a reduction in the output of industrial products of many millions of rubles under the 11th Five-Year Plan.

A Shortage With an Abundance

The lack of correspondence between the supply of information and the needs of the directive agencies of the kray is increasing very rapidly. During 1970-1985 more than 45 billion rubles' worth of capital investments were invested in the kray's national economy. This made it possible to triple the volume of industrial production capital and increase its value to more than 16 billion rubles. During this same period the quantity of circulating management information increased more than 10-fold and reached a volume equal to 376,000 books with 500 pages each. Moreover, each year, according to the most modest calculations, about 30 million more written documents are composed. But these quantitative and qualitative changes received no attention. Information support for management was not promptly adapted to the new economic conditions.

Scientific organizations and planning agencies, when drawing up the strategy for the kray's development, even 15 years ago were well aware of what the territory's production potential would be. It is quite natural that even at that time they had to reveal and predict the future needs of the management agencies for various kinds, flows, structures and volumes of information and, on the basis of this, develop requirements for the system of information support on the basis of modern computer equipment and begin to plan it. Unfortunately, this was not done.

Of the 137 statistical bulletins published annually by the kray statistical administration only 2.9 percent are devoted to scientific and technical progress, 1.4 percent--to transportation, 0.7 percent--to natural resources and the environment, and 1.4 percent--to science and culture. At the same time 35.0 percent of all the bulletins are oriented toward agriculture, which produces less than 10 percent of the kray's products.

About 2 million rubles a year are spent on the functioning of the kray statistical administration. The volume of data produced annually is very great. It is difficult or completely impossible to make one's way through the jungle of figures to the necessary information just as it is impossible to directly utilize ore as metal. Only 10-15 percent of the output of the kray statistical administration, produced in the form of analytical notes and reports, can be put to use.

While there is an immense surplus of the quantity of data there is a critical shortage of high-quality information. Therefore the kray management agencies have been forced to resort to one-time questionnaires and investigations which require considerable labor expenditures, financial resources and time. Information is also made more costly by departmental separation which leads to a situation where the same data are prepared in various agencies and administrative units.

The disorderliness of information flows is appreciable. For example, an immense quantity of data goes into the kray CSPU committee and the ispolkom of the kray soviet of people's deputies, and this pertains especially to the top managers of the kray. But they receive not analyses, but unprocessed data. Thus the department of labor resources in 1983 sent the chairman of the

ispolkom of the kray soviet a report entitled "On the Fulfillment of the Target Comprehensive Program for Increasing the Effectiveness of the Utilization of Labor Resources in the Kray During 1981-1982" which took up 25 pages. An analysis of the content of this report showed that its essence could quite possibly be covered with one page of text.

There is a special agency for working with scientific and technical information in the kray--the interbranch territorial center for scientific and technical information and propaganda. There are plenty of clients for its products: 430,000 engineering and technical personnel, and 61,000 inventors and efficiency experts. The reference information supply of the Krasnoyarsk Center for Scientific and Technical Information contains more than 5 million various documents, but they are poorly utilized. In addition to other departments, the center serves 679 enterprises and organizations under the direct jurisdiction of the ispolkom of the kray soviet. In 1982 the Center for Scientific and Technical Information sent them 28,400 units of information materials, but only 11 enterprises utilized the proposed innovations. Of course, the fault for the slow introduction of scientific and technical innovations lies not only and not so much with the information services. But there is no doubt about the inertia of the Center for Scientific and Technical Information.

Modern methods based on electronic computer equipment are being introduced into the practice of work with information slowly and with large shortcomings. At the present time, for example, in the kray's economy there are several dozen ASU's for various purposes whose actual effectiveness is low because of the incompleteness of the approach to management and the desire to solve only particular, local and not integrated problems. There are 80 computer centers in operation in the kray and just as many ASU's but there are clearly not enough computers for them. The kray is considerably below the unionwide level in the utilization of computer equipment both in production and in management. But even the available equipment is utilized basically at the level of associations, enterprises, and organizations. There are no ties between them. There are no ties with the kray management agencies either, and no automated system of state statistics have been created. Many of the existing computer centers are not very effective. For example, the branch information computer center of the timber industry was created for serving all enterprises of the branch, but because of the poor planning and departmental prejudices as well as the lack of terminals and channels of communication, it serves only the Krasnoyarsklesprom Association. The number of personnel at the Krasnoyarsk Information Computer Center is almost equal to the number of personnel on the management staff of the association. Another extreme: the system for capital construction is in critical need of centralized processing of information, but the computer center was created exclusively for the needs of Glavkrasnoyarskstroy.

What Should the System for Information Support Be?

There is reason to assume that in this situation this problem can be solved with the help of the interbranch association called "Information Complex."

Structurally the "Information Complex" Association should consist of three closely interconnected organizations: the computer center for collective use, the kray statistical administration, and the kray interbranch center for scientific and technical information.

The "Information Complex" Association is not a mechanical unification of traditional information units, but an organization with new functions. The main target function of the "Information Complex" is to provide management agencies of the kray (branch and functional divisions of the kray CPSU committee, party gorkoms and raykoms, the ispolkom of the kraysoviet, the gorsoviet, the raysoviets and the branch administrations and associations) with the necessary prompt, complete, reliable, concise information which is in a convenient form.

This is not an ordinary test. It is necessary to take a different approach to many issues. Each unit of the "Information Complex" must perform strictly specialized functions. Thus the administrative staff of the association is not so much a staff agency as a scientific-economic one, which must:

develop a system of changing requirements and criteria for information sent to the management system;

meet the information needs of the branch and functional divisions of the kray CPSU committee, the ispolkom of the kraysoviet, the krayplan, the kray division for labor resources, branch administrations and associations for control and analysis and for preparation and the adoption of management decisions;

analyze and revise documentary information circulating in the management system in order to reduce the flows and the masses of data, to reduce the amount of paperwork, and so forth.

Centralization of the information supply for the management system will make it possible to overcome many department barriers, avoid duplicated production of information, increase its selectivity and significantly reduce expenditures on production as well as to apply modern technical equipment effectively. The best variant for its utilization is in ASU, with the conventional name "Krasnoyarsk." Because of failures on the part of the krayplan time has passed and it will take 5-7 years simply to create the planning estimate documentation. A way out of this situation can be seen in the formation of a regional automated system for state statistics, whose technical base would be a multimachine computer center for collective use (VTsKP). Its base is a network of rayon and city computer centers, branch information computer centers, and information computer centers and computer centers of administrations, associations and large enterprises. This would make it possible to automate the collection, processing, sorting, accumulation, storage and issuance of the necessary data and to eliminate nonproductive local computer centers of the kray plan, the krayflo and other kray agencies as well as to provide for the performance of computer work from subscription points through subscriber networks. In Krasnoyarsk alone the economic effect from the introduction of the VTsKP would be about 50 million rubles with a time period of 3 years for recouping investments. The electronic system for

processing data will make it possible to create an automated data bank with information bases called "Nature," "Production," "Population" and "Management," and these would make it possible to change over to information service on request from consumers, which will greatly reduce the cost of information, accelerate the process of acquiring it, and eliminate the circulation of surplus information. Labor productivity in the information sector is becoming a factor for increasing the effectiveness of public production in all industrially developed countries. [Footnote 1]

The creation of the VTsKP and in time also the ASU Krasnoyarsk will require considerable material and technical resources and volumes of scientific and planning work. But the material expenditures that will be required in the next 5-7 years cannot be compared with the possible economic detriment that will be caused by archaic information supply. As concerns scientific support, in the kray there is a large computer center of the Siberian branch of the USSR Academy of Sciences with highly skilled personnel and there is a branch of the All-Union Planning and Technological Institute for Mechanization of Accounting in Computer Work, which even today has begun to develop proposals for creating the VTsKP.

In the kray statistical administration, instead of the traditional divisions that summarize branch information, it will be necessary to create analytical divisions.

The outgoing documents could be arranged in keeping with three types of required information: current, medium-range and long term.

Current, operational information concerning the course of production processes is basically economic information. It is at the center of the attention of management agencies. Since up to 40 percent of the volume of their work is taken up with conducting periodically repeated measures, it would be expedient to present the part of the information pertaining to the course of the fulfillment of all sections of the annual plan (for the kray as a whole, for the branches, for the administrations and for the associations) in the form of statistical bulletins with a limited number of standard indicators. When there are any deviations, there should be brief notes concerning the nature and causes of the appearance of problems and the damage that it caused. The preparation of management decisions directed toward eliminating problem situations is the function of the krayplan.

Medium-term information reflects processes of future development of the national economy of the kray and encompasses a period of from 5 to 10 years. The kray statistical administration should be responsible for providing information to accompany large-scale decisions concerning measures for further comprehensive development of productive forces of Krasnoyarsk Kray and the comprehensive target program "Intensification-90." The output documents of the system for information to accompany programs could be: analytical notes; reports on the results of the planning period, problems that are revealed and factors causing them some: responses to requests concerning individual sections of target programs; and reminders of the approach of deadlines for carrying out the most important tasks.

It is clear that all the information documents should be strictly algorithmized and should be extremely brief.

Long-range information is a reflection of the "schema for the development and distribution of productive forces of Krasnoyarsk Kray during the period up to the year 2000." Information about its implementation is provided on requests from management agencies.

The production of information concerning scientific and technical progress is a special function. This pertains not to ordinary statistical reporting, but qualified analysis of data and the preparation of informational materials concerning the fulfillment of planned tasks and problems in the area of scientific and technical progress.

Control of intensification and acceleration of the very process of technical reequipment of the society leads to a rapid growth of the needs for information concerning the achievements of science and technology, their application in production, and their influence on increasing the effectiveness of production. On the other hand, management agencies should have complete information about the nature, rates and effectiveness of technical reequipment and about scientific and technical problems of the kray's national economy. Probably further production of traditional information sheets should be halted in the very near future. It would be more efficient to take a selective approach to the requests. But an exhaustive answer to the question of the form of presenting data concerning scientific and technical progress will be provided only by practice. It would be expedient to issue statistical data concerning scientific and technical progress in the form of comprehensive interbranch analyses and analyses for regional target complexes (construction, timber industry and so forth).

The organization of information supply in the kray is in need of a radical restructuring. Otherwise the tasks of intensification of production cannot be carried out properly.

We are convinced that Krasnoyarsk Kray is not the only place that has this problem.

FOOTNOTES

1. Gromov, G. R., "Natsionalnyye informatsionnyye resursy: Problemy promyshlennoy ekspluatatsii" [National Information Resources: Province of Industrial Exploitation], Moscow, "Nauka", 1984, p 32.

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CSO: 1820/32

IMPORTANCE OF LOCAL INDUSTRY STRESSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 80-89

[Article by G. V. Vyatkin, candidate of economic sciences, docent at the Kuban State University (Krasnodar) and I. A. Peronko, chief of the financial division of the Armavir Gorispolkom: "Local Industry: Everything for the Region"]

[Text] The comprehensive program for the development of the production of consumer goods and the sphere of services during 1986-2000 envisions measures for the development of local industry and the strengthening of its material and technical base, taking regional peculiarities into account. How does one coordinate the production of goods for the people in the region and provide the population with everything they need?

Wine or Compote?

Let us begin with production planning. No one will deny that local soviets of people's deputies know best of all both the capabilities and the needs of the region for goods that are in mass demand. But frequently the ministries and departments ignore proposals from local agencies. Let us take this example. The Krasnodar Kray Administration of the Food Industry and the krayispolkom have repeatedly suggested to the RSFSR Ministry of the Food Industry that they reduce the production of wine, which is produced by enterprises of the food industry under local jurisdiction. But the RSFSR Ministry of the Food Industry from year to year increases the planning assignments for the output of wine. It comprises more than 40 percent of the overall production of the kray food industry. Containers in boxes are shipped back to the Kuban by the carload. Transportation expenditures alone amounted to more than 20 million rubles.

We have given this example in order to illustrate the negative consequences of arbitrary, administrative methods of planning. They must not be repeated when planning other items for the local market.

After the publication of the decree of the CPSU Central Committee, "On Measures for Overcoming Drunkenness and Alcoholism," enterprises of the kray food industry have been rearranging production for the output of food products that are necessary to the population. But this work is proceeding extremely

slowly because of the difficult financial position of the enterprises. They need financial and material assistance in order to rearrange production.

The needs of the population for confectionery and pasta items, dried fruits and other products are always satisfied. The output of reserves, jams, compotes, jellies and diabetic and dietetic items decreases each year. In the summer the permanent population and the vacationers are poorly supplied with nonalcoholic beverages, mineral water, kvass, and quick-frozen products.

It seems to us that when establishing the plan for industry under local jurisdiction the branch ministries and departments should establish only the overall volume of production and the list of products delivered outside the region, and the assortment of products that are produced and the quantity that are produced for the needs of the given region should be decided by the local agencies, taking into account the demand of the population, as is envisioned for enterprises of the state agroindustrial complex.

Let us take another problem that is also related to planning. A broad range of enterprises of various branches of the national economy and of republican local jurisdiction that produced thousands of kinds of products are enlisted in the production of consumer goods. Their activity needs to be coordinated and regulated at a regional level, taking into account the production capacities of each enterprise. In our opinion, this task should be the responsibility of local soviets of people's deputies. The decree of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers, "On Further Increasing the Role of the Soviets of People's Deputies in Economic Construction" (March 1981) grants them the right to develop and approve consolidated plans for the output of consumer goods. The decree of the CPSU Central Committee, the Presidium of the USSR Supreme Soviet and the USSR Council of Ministers, "On Measures for Further Increasing the Role and Responsibility of the Soviets of People's Deputies for the Acceleration of Socioeconomic Development" (June 1986) expands the rights of local soviets even more. But the ministries, especially the union ones, are slow in rearranging themselves. This pertains first and foremost to heavy industry. Thus enterprises of the USSR Ministry of Heavy and Transport Machine Building, the USSR Ministry of the Electrical Equipment Industry, the USSR Ministry of Chemical and Petroleum Machine Building, the USSR Ministry of the Machine Tool and Tool-Building Industry and a number of others located on the territory of Krasnodar Kray produce the simplest goods for domestic and household use which are also produced by enterprises under local jurisdiction.

Frequently heavy industry enterprises assimilate and produce items for which there is no demand among the population. For example, the Tikhoretsk Production Association (Tikhoretskputmash of the USSR Ministry of Heavy and Transport Machine Building for many years has been producing standard lamps and carts for gardens and orchards. And despite the fact that as early as 1983 the trade organizations started rejecting these products, it is not until 1988 that the association intends to stop producing them. There is no sales market for products produced by the Krasnodar Compressor Plant of the USSR Ministry of Chemical and Petroleum Machine Building (electric sprinklers, spoons and forks made of nonrusting steel, "runners" or Zhiguli automobiles). Yet, as before, consumer goods, including the simplest ones, are shipped in to

Krasnodar Kray from other regions of the country. For example, from Karelia we bring in butterfly nets, from Leningrad and Rostov--children's score cards, from Sverdlovsk--plastic dominoes, from Rostov and Gorkiy oblasts--household knives, and so forth.

There is much in common for the organization and technology of production of a wide range of the simplest commodities. And the demand for these commodities exists everywhere. This means that they should be produced in small enterprises of various branches of local industry. And large enterprises of heavy industry should specialize in the output of technically more complicated durable goods. An investigation of enterprises of the kray showed that they could produce more complicated consumer goods that are needed by the population. For example, there is never complete satisfaction of the demand for electric coffeepots, mixers, vacuum cleaners, electric meat cutters, electric irons and so forth.

It is precisely the local agencies, in our opinion, that should plan the list of consumer goods to be produced in their region both for local and for union-republic industry, and make sure that the majority of production is local.

Difficulties in Coordination

Before a new item goes into production it has to pass over a long path of coordination, consideration and approval in various organizations, which sometimes take up to a decade and a half. It has already been said more than once that the existing policy for coordination and approval of normative technical documentation for new kinds of items, even the simplest, is very complicated and lengthy and that it holds up the process of updating products. Thus the technical specifications for the fittings for breadboxes which are produced by local industry were considered initially in the planning and design bureau of local industry, then in the Moscow Technological Institute and the base organization in the city of Riga, and only after that were they approved in the kray center for standardization and metrology. This took almost a half-year.

Or take another problem that is also related to the updating of products. When assimilating the output of the first batches of the new item production outlays are greater than with series output. But this is not always taken into account by the price-setting system. The prices do not have enough flexibility, and the increments to them for items with the index "N" do not always work effectively. One can give many examples where these items are accumulated in trade, there is demand for them, and they are marked down. Practice shows that in local industry as in no other branch of the national economy the constant updating of products is effectively stimulated by contractual prices for the first wholesale batches of goods and for especially fashionable items for which there is an increased demand among the consumers. The kray has experience in this and it should be disseminated.

It would seem that consistent fulfillment of party and government decisions concerning improvement of control of product quality adopted in the spring of 1982 will change this practice in the near future.

Concerning Wastes and Incomes

It is possible to continually increase the output of consumer goods on the basis of maximum utilization of wastes. Recently a good deal has been done in this area. In 1985 local industry enterprises of the kray more than doubled the output of consumer goods made of byproducts as compared to 1980. Industrial byproducts are used to produce 169 kinds of items worth more than 7 million rubles a year. In 1984 alone 68 new kinds of items were assimilated.

But wastes from industrial and agricultural production are still clearly not being utilized sufficiently. For more complete salvaging it is necessary, in our opinion, to take a number of measures. First, it is necessary to bring order into the accounting and distribution of wastes and to give planning commissions of the kray (oblast) ispolkoms the right to distribute and redistribute production wastes of all enterprises, regardless of their jurisdiction. Production wastes should be reprocessed primarily in the places where they are obtained. If this is impossible, they should be transferred for processing to other local industry enterprises and only if it is impossible to utilize the wastes in the region can they be shipped outside.

Second, it is necessary to increase the incentives of enterprises that produce goods from wastes. According to the policy in effect at the present time, the consumer fund is formed at enterprises that produce consumer goods from the wastes of their own production or from wastes received from other enterprises if the value of these wastes comprises 50 percent or more of the value of all the raw and processed materials used for the manufacture of various items. In our opinion, it would be expedient to deduct the profit into the consumer fund in proportion to the utilization of wastes in the given item. This would make it possible to significantly increase the consumer fund and correspondingly the money used for expansion and reconstruction of existing enterprises and the construction of new shops and sections which would use wastes for producing consumer goods.

Managers are in no hurry to take on additional trouble to produce goods made of local raw material because of the inadequate incentive for their production. The implementation of the July 1986 decree concerning increasing the role and the responsibility of the soviets of people's deputies should produce favorable changes in this connection.

How To Attract the Homeworker?

At the present time in local industry of the kray home labor is used by more than 70 percent of the enterprises. More than 2,000 people are working at home. In 1984 they produced 11.7 million rubles' worth of products, which comprises almost 8 percent of the production of consumer goods. But still home labor is being used inadequately. Only one out of four pensioners are working in the kray, and there is a total of 1.2 million of them. Yet the economic expediency of the home form of labor is obvious. For example, the creation of one work position on an average for all branches of local industry requires capital investments of from 3,000 to 3,500 rubles, while expansion of the home forms of labor would only require half this amount of money--for acquiring equipment and means of transportation.

There are still many impeding factors in this matter. First of all, people employed in home labor are poorly provided with modern equipment. Local industry cannot solve this problem without the help of machine builders. They should arrange for the output of small, convenient, simple-to-use technical equipment for the most varied purposes. But so far the main implement of labor for the home worker is still the sewing machine.

It is also necessary to improve the incentives for enterprises that use the labor of pensioners, disabled people and housewives. A special fund is now created at these enterprises only if the pensioners and disabled persons comprise more than 30 percent of the workers. It seems to us that this fund should be created at all enterprises under local jurisdiction according to the proportion of working pensioners and invalids and the volume of products they produce. Moreover, it is also necessary to form a special fund at enterprises that use home labor.

How To Reequip Local Industry?

The majority of enterprises of local jurisdiction have weak technical support and outdated technical equipment and technology. The rates of their technical development and the updating of production capacities lags significantly behind those of enterprises of union and republic jurisdiction:

	<u>1980</u>	<u>1984</u>
Growth rates of industrial production fixed capital, %		
Industry, total	100.0	127.2
Including under local jurisdiction	100.0	117.9
Coefficient of updating of industrial production fixed capital in industry, %		
Industry, total	7.6	7.1
Including under local jurisdiction	7.4	5.6

In local industry in the kray during recent years there has been an increased proportion of capital investments in technical reequipment of enterprises. Thus while in 1980 5 million rubles' worth of capital investments or 26.4 percent were used for these purposes, in 1984 it was 6.5 million rubles or 38.1 percent of the capital investments. Practice shows the advantage of capital investments in technical reequipment of associations and enterprises of industry under local jurisdiction. Thus the Krasnodar Raduga Production Association, having spent 800,000 rubles for these purposes, will increase the output of items, mainly toys, by 15 million rubles. Unfortunately, such examples are rare in industry under local jurisdiction.

One of the main factors impeding technical reequipment of enterprises of local jurisdiction, in our opinion, is that this restructuring is carried out basically through their own efforts and funds, which, unfortunately, are not sufficient. Reequipment is paid for mainly from the fund for the development of production. But it is very small and it cannot increase since with obsolete and worn-out equipment and backward technology it is impossible to

produce profitable and high-quality goods which produce a large amount of profit.

Before 1981 the fund for the development of local industry was very important in the technical reequipment of enterprises. At that time it was created in amounts of 20 percent of the calculated profit. According to provisions in effect at the present time this fund is formed in an amount of 6 percent of the calculated profit and at a number of enterprises it is not formed at all because of the small amounts. It was assumed that a large role in the technical development of the enterprises would be played by the fund for the development of production, but in practice this has not happened. As a result, the overall sum of these funds used for construction, reconstruction and technical reequipment of enterprises of local industry has decreased sharply. Thus while in 1980 it amounted to 4.4 million rubles, in 1984 it was 2.4 million rubles.

A certain role in the technical development of enterprises under local jurisdiction is played by funds from amortization deductions for complete restoration of fixed capital, but even they are being removed from the enterprises in significant amounts (up to 70 percent). Taking into account the small sizes of the enterprises and the small volumes of production, in our opinion, it would be expedient to leave the entire sum of amortization deductions at the disposal of industrial enterprises under local jurisdiction. And the fund for the development of local industry should be created not only at enterprises of the RSFSR Ministry of Local Industry, but also at enterprises of other ministries under local jurisdiction. This would mean an increase in the production of goods that are in mass demand, and expansion of the assortment and an improvement of their quality.

Improving the Structure of Management

The existing structure of management of industry under local jurisdiction is imperfect. Its main shortcoming is the large number of objects of management. For example, the food industry administration in the kray has jurisdiction over 44 independent enterprises. A number of union ministries do not have this many objects of management. Of course, the enterprises under the jurisdiction of the ministries are larger. But small enterprises have more problems than large ones do. The staffs of the administrations with a large number of enterprises under their jurisdiction are engaged mainly in paperwork and there is little time for giving practical assistance to the enterprises.

Where can one see a way out of this situation? The main path is a significant expansion of the operational independence of enterprises and a corresponding sharp reduction of the flows of management information. But this falls outside the realm of competence of the local management agencies.

Another path is the creation of production associations. It produces fairly good results. But in 1978 in Krasnodar three small enterprises (a plastics plant, Metalloigurshka and Metalloshtamp) were combined into the production association Raduga. During the period since the time of the creation of the association the volume of production of products, mainly toys, has increased by one-third and it has become easier for the local industry administration to

control this group of enterprises. But an association is not always effective. For example, a different result was obtained by grouping construction materials enterprises into one association, Krasnodarstroyaterialy. While before the consolidation of the brick plants the volume of production of wall materials amounted to 565.8 million conventional bricks, afterwards it was only 471.1 million, or 27 percent less. Before the association all plants were profitable (in 1973 the profit was 2 million rubles). After the association state subsidies were required to cover losses (in 1984--1.7 million rubles). The unsuccessful results here were brought about by the territorial separation and the lack of any mutually influencing factors of one plant on the other. All plants had a closed cycle. Therefore, in our opinion, when creating associations of small enterprises under local jurisdiction it is necessary to take into account not only their branch homogeneity, but also their territorial proximity and the possibility of the appearance of mutually coordinated combinations of production of these enterprises that are advantageous for the entire association.

There is one more path to reducing the number of enterprises under the jurisdiction of kray industrial administrations--increasing the number of enterprises under dual jurisdiction when, in addition to being under the jurisdiction of the regional kray administration of local industry they are at the same time under the jurisdiction of the ispolkoms of city and rayon soviets of people's deputies. This will make it possible to relieve the staff of the regional administration of individual functions in managing these enterprises and at the same time increase the role of the soviets in the development of local industry. Certain measures have been taken in this area in the kray. Thus since 1 January 1985 15 enterprises have been transferred from kray to rayon and city jurisdiction. Of a total of 100 associations and enterprises 51 are under dual jurisdiction.

Additionally, it is necessary to consider the question of transferring to union republic jurisdiction productions and enterprises of industry under local jurisdiction that produce kinds of products that are not appropriate for them and transferring to local jurisdiction individual enterprises of union and republic jurisdiction that produce products which are basically sold on the local market. It is incorrect when a winery in the village of Leningradskaya in Krasnodar Kray, which produces wine and delivers it far beyond the kray, is an enterprise under local jurisdiction while the Krasnodar Association of the Beer and Nonalcoholic Beverages Industry which sells its products in the kray is under republic jurisdiction.

The suggestions made in this article are not indisputable. It is possible that they can be countered with others. One thing is clear: the territorial administration for the production of consumer goods must be improved so that it will be an effective instrument for the economic and social development of each region of the country.

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11772

CSO: 1820/32

RENTED EQUIPMENT USED IN PRODUCTION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 89-97

[Article by L. Khochunskaya (Moscow): "Our Partner--The Rental Point"]

[Text] Rental is the release of a thing for temporary use and the payment for this. Pianos are sent from one rental to another. The Italian king rented his army to the French sovereign, it was under hire, and marched....

V. I. Dal

Early on a Saturday morning in the passenger area by the railroad station one can see a line of people at the blue kiosks with signs saying "For Rent." The lines move quickly and therefore it seems that they do not get any longer. People who have left the kiosk carry in their hands spades, buckets and watering cans. The flow of people is moving in the direction of the suburban electric trains.

After 20-30 minutes the trains have left these people armed with spades at the Moscow suburban platform. Tomorrow, when the sun drops below the horizon, the electric train will pick up the passengers returning to Moscow from their dachas and garden plots. In the area by the train station they will again go up to the familiar kiosk and return the watering cans, buckets and spades. This happens every week and every month. In the spring, summer, and autumn workers of the Mosgorbytprokat will wait for the dacha residents and gardeners at the areas near the train station in order to help the Moscow residents solve a number of troublesome problems: where to obtain gardening supplies, where to store them, how to repair them. This is a case where consumer services have made their way to the consumer. The searches have been going on for a long time and recently they have become more purposive in nature. The needs of the population are taken into account, investigated and analyzed by a special service of the Mosgorbytprokat firm. But so far this work is still far from being perfect. What is hampering it?

Of all the kinds of service, rentals are the least criticized. At least they cannot spoil anything for us here. The barbershop, the sewing atelier and the dry cleaner are more vulnerable in this respect. To be sure, the rental point

cannot justify our hopes even though its task is precisely to satisfy the desires of the clients and to satisfy the needs of the population for bicycles, tape recorders, sewing machines, camping tents, and television sets.

There is no need for special proof that this kind of service as conceived is convenient for the population. If one of our children wants to skate we drop into the nearest rental point and take out some skates. If he wants to ski--we take out skis. It is also obvious that this is advantageous for the population. As the child grows, these same skates would have to be purchased three or four times in a store. Add skis and bicycles.... But when it comes to renting a color television set, here the advantage is considerably greater. When a buyer goes to the store for a color television set he hopes for success and, of course, he also arranges lasting contacts with the television store or makes sure that the picture tube does not "burn out" as soon as the guarantee expires. Alas, the quality of these goods is far from perfect. But if one rents a television set then, in the first place, all concerns about repair are the responsibility of the rental agency and, second, after 90 days the payment for the television set is cut in half so the sum of payments for renting for years is quite comparable to the price of a television set.

It is advantageous to the client and advantageous also to consumer services: the turnover of capital increases. The Mosgorbytprokat firm gives figures of annual profit in the amount of 603,000 rubles. In the country as a whole rentals last year produced a profit of 20 million rubles. The profitability of the branch was 18.95 percent.

These results would probably be fairly good for the nonproduction sphere if they were regarded on one plane: the interrelations between the rental service and the renter (this is what they call their clients). But if one looks at the interconnection: the rental service--the state, the picture is different is different. An analysis of the indicators that characterize the development of rental services during the 10th Five-Year Plan revealed that expenditures significantly exceed incomes and Gosbank debts are twice as great as the profit that is obtained. Under the 11th Five-Year Plan this tendency remained, and the increased volume of rental services will inevitably entail an increase in expenditures as well. The shortage is covered through redistribution within the ministry. In other words, the more intensively the rental service develops, the more funds are taken away from other consumer service branches. An analysis provides a clear picture of the wave-like income of profit at the beginning, middle and end of the five-year plan, depending on the possibility of bringing in additional funds. In the new light, the annual profit of the branch--20 million rubles next to a figure of 50 million--and the paying off of Gosbank loans no longer seem high enough. Indeed, everything is relative.

And yet the branch is keeping up with the plans and increasing the volumes of services. The Mosgorbytprokat firm, for example, provided for fulfillment of annual economic indicators in 9 months. The output in excess of the plan was increased by 1.5 percent, and the production cost decreased by 1.2 percent as compared to what was planned. The firm in the capital alone renders 5.8 million rubles' worth of services to the population. There are dual reasons for this. The profit and loss situation of the branch is both objective and

subjective in nature. The main thing that predetermines the form of development of this nonproduction sphere of services is the impossibility of expansion as a result of its own funds and, consequently, its direct dependence on the Gosbank. But it is not so simple to fit into the bed of procrustes of bank credit. And it also costs a great deal.

The 3 years that are established for paying off loans is too short a time period for the rental service. Even if one were to take the most popular and profitable item--the color television set (30 kopecks a day)--and assume that it would be taken out by someone new each month, meaning that the rental point would not lose anything on rebates to clients for extended use, even in this case only 324 rubles would come into the cash register--half of the value. Let us say that the hypothetical situation were ideal: not only are there not any "idle" television sets, but there are not any malfunctions either, which the rental point must pay for.

Frequently the Gosbank decides to take advantage of its right to allow the loan to be repaid over a long period when it discovers that the normatives are not met. For instance, a certain sum of credit has been taken out to repair the rental supply. But the television sets remain in the showroom unrepaired: the atelier has not sent the master repairman on time. Gosbank inspectors cannot figure out who is right and who is wrong. They have one law: financial discipline. The bank begins to ask for the loan to be paid back on time. The rentals thus sustain a double loss: losing the opportunity to obtain profit from objects that are no longer in circulation and also it pays interest on the profit it has not obtained.

Where is the solution? The solution is to have the Gosbank approach rental items not as circulating capital, but as fixed capital which essentially they are at rental points. If the commodities for rental were registered as equipment this would reflect the actual state of affairs. Everyone would stand to gain: the state, the population and the rental points.

But as of now the rental service has only one way out: to search for a solution from its own resources. And this is not the easiest path. They have even tried to raise prices. It would seem that profit would increase, indebtedness to the bank would be paid back, the need for credit would decrease, but somehow they did not think about the client. He will use the rental services as long as they are advantageous for him. There began a mass return of television sets to the rental points. The renter refused to pay the new prices. Then the losses were greater than were anticipated. Moreover, the television sets stood idle--they still took up space, impeding the updating of the rental stock. It was necessary to introduce the new price list, which is in effect now, and does not infringe upon the interests of the client. It also now envisions a 50 percent rebate for long-term rental--after 90 days the client begins to pay, for example, for a television set not 30 kopecks a day, but 15. This is advantageous to the population.

Another path is extensive introduction into the rental practice of commodities that are in critically short supply, for which it is possible to establish a special price list with higher prices. But these prices would be reduced as the items that are in short supply appeared for sale. The rental workers know

how great the demand is for imported radio and television equipment, cooking sets, and photographic equipment. This demand is not being satisfied--the renter is being offered domestically produced goods, which are frequently old and not always of good quality. And yet the client would pay high rates for a Sony tape recorder or a Nikon camera. Is there any need to mention that this is an entirely different situation on the moral plane as well? In other words, it would be expedient for the priceless to be flexible and particularly for it to take into account the "prestige" of the rented object. This would require a rearrangement of relations with trade so that it would be interested in selling goods that are in short supply to the rental agencies. These relations are not the best right now. There is an order according to which trade is obligated to provide the Mosgorbytprokat firm with the necessary goods. Orders for goods are drawn up each year and approved at the level of the ministries of Consumer Services and Trade. This kind of order is the law for the trade network. But...the law is the law, and life is life. The plan for the purchases includes 53 positions. The trade network provides 100 percent of the goods for only 44 positions. The rest are satisfied by 40-70 percent. These include boats, skis and sewing machines, of which there is a great shortage. The trade network prefers to sell these goods itself, because it is not advantageous for it to turn over goods for which there is a great demand to the rental firm. In 1962 a decree of the USSR Council of Ministers determined that when selling goods to organizations (this includes the rental service) their value is included in the plan for commodity turnover, but is not included in the plan for the market supply. And for trade workers a great deal depends on this. And so it turns out that it is more advantageous for the store to sell things from the counter and to receive payment in cash for them today than to wait until the rental firm rents the commodity and pays for it from the rent.

In order for the stores to give up commodities that are in critically short supply it is necessary to find the additional economic incentives for trade as well. This is a serious plan on whose solution the effectiveness of the rental service largely depends. Its solution could be simplified if the rental service were given the right to select at the base and then pay for the purchase at a particular store. But this is a temporary solution to the problem: the situation dictates new rates and new volumes of services for the population.

The multistage system of orders for updating rental supplies can no longer keep up with the growth of the demands of the people. New industrial goods are being produced each year. Certain enterprises update their assortment of products several times during the year. People go to the rental point in order to acquire for temporary use what they cannot purchase in the store, but the rental point does not yet have this new product since it made its orders to trade according to last year's assortment. The supply lags significantly behind the demand, and this pertains both to quantity and to quality.

And a question arises here: Why should the rental service not make direct contacts with the enterprises that produce goods that are in demand among the population? The advantage would be mutual. The rental agency could efficiently augment and update its supplies, satisfying the needs of the population, and industry would have the opportunity to "rent" new products to

the consumer while producing them in small batches. The service would give information concerning the demand and quality of the item as well as remarks and suggestions coming in from the population. In brief, it would play the role of a testing base or a firm store. The rental points could also become something like advertising bureaus for the new products.

I was told about an interesting fact in the RSFSR Ministry of Consumer Services: In one city of Siberia the rental service managed by some miracle to acquire a large quantity of sewing machines--items that are in high demand. The immense list of people who had signed up to buy this item in the stores disappeared in a couple of days. The trade network no longer needed to excel in searching for deliveries in order to satisfy all who needed them. This is one more word in favor of providing this service with items that are in short supply first. This means more than just convenience and advantage for the population. The increase in the output of certain kinds of durable goods can be reduced, giving priority to other kinds, if the rental points are fully supplied with them so that anybody who needs them at any time can acquire them for temporary use.

An interesting form of service to the population has been found in Odessa. Recently an entire street of small rental points called "Do It Yourself" has been in operation here. They are remarkable because the clients use the rented equipment here, without leaving the premises. On specially equipped floors of residential buildings that are halfway underground there are tables with typewriters, benches with a selection of carpentry and woodworking instruments, or sewing machines. A person can come in and type or build or sew. These small rental points not only efficiently satisfy the needs of the population for various items, but also play an important role in organizing activity-filled leisure for the residents. It was noted that it is not only adults who visit the minishops and not only for purely utilitarian purposes. Many parents come there with their children. The mothers teach their daughters to sew and the fathers teach their sons to plane, solder or pound nails.

A large role in the creation of the unusual "Do It Yourself" street in Odessa was played by the city soviet of people's deputies, which rented systems to the consumer services in the selection and allotment of premises and the provision of the necessary equipment. The experience of the Odessites deserves extensive dissemination.

In general, the local soviets have great opportunities to stimulate the development of services. It has been calculated in the Ministry of Consumer Services that expenditures on multistage planning is costly to the state and to the population and that it would be more effective if problems of providing the rental supply would be solved by the local soviets, making the corresponding changes in the plan for trade. Then, with information about the appearance of new kinds of goods in the trade network, the city soviet could allot them for the rental points. It would also be possible to send a certain quantity of consumer goods produced by local enterprises for trial here.

Rental workers are not satisfied with their interrelations with the repair service. Why are objects, the demand for which is still difficult to satisfy,

gathering dust in the warehouses of the rental points? For example, if a color television set has broken down, and this happens frequently, it would be folly to hope that it would be repaired as quickly as a privately owned set would. The shop of the Elektron Production Association, with which the Mosgorbytprokat firm has an agreement for repair of television sets, is in no hurry to send its masters to the rental points: this is not advantageous for them. An indicator which depends on services granted to the population (not organizations!) is planned for the production association. So malfunctioning television sets stand idle for months, causing double or even triple losses to the rental agency. The same thing is true of refrigerators and tape recorders. The losses run into the thousands of rubles.

There is one other item of losses of which the Mosgorbytprokat cannot rid itself through its own forces. This is wear and tear on the rental supplies. The firm has been given the right to reduce the prices on the price list annually, depending on the wear of the item. But it takes advantage of this right only after the time periods for the service of the objects have expired. Then a commission meets, draws up documents, and makes a decision. But in practice it frequently happens that the item, even after the second or third user becomes unattractive and there is no demand for it among the clients. If the firm had the right to reduce the rental price for it, the item could be rented. The enterprise would receive at least part of the sum, while now it sustains direct losses for several years.

Considerable difficulties arise when the service life of an object expires. After this there are two paths. The first is salvage, and then the workers of the rental service take it apart with their own hands, they break apart and beat up that which they have protected for so many long years. And this takes a considerable amount of time and effort. The second path leads to the concession store. It would seem that this is more reasonable and economical, but there are more problems with documentation. It sometimes takes weeks for the merchants to come and evaluate the items that have been written off. When the evaluator finally comes, the selection is very rigid--the merchants, naturally, are looking out for the interests of the store and are overly cautious. As a result, good things go for salvage while they could serve for several more years. But it would be possible to single out one concession store, especially for rental objects. They could be sold at the lowest price and still this would be advantageous. Finally, in such a store it would be possible to create divisions for spare parts, and this would be much better than sending them to be salvaged as scrap metal.

Recently the RSFSR Ministry of Consumer Services made a suggestion to let rental objects that have served their time remain with the renter under the condition that he pay a certain percentage of the value of the object. For instance, for a color television set whose service life has been determined at 6 years. The client who has used the television set for a long time at the end of 6 years pays the rental point 60-70 rubles and becomes the legal owner of the thing. This is advantageous both to the renter and to the state. The former receives the thing as if on long-term credit and, in the final analysis, with a rebate of 30 percent, taking into account the benefits for long-term use. From each such television set the state receives an income equal to the value of its annual rental. In other words, for the state it is

as though the period the television set was in circulation were extended for another year. This can easily be seen in figures. For the first 3 months the renter pays 9 rubles each for the color television set. The total is 27 rubles. After this the 50-percent rebate for long-term use goes into effect. This means that for the remaining 9 months the client pays 4.5 rubles a month. The total is 40.5 rubles. A total of 67.5 rubles are paid during a year. This is approximately the sum the client pays the state when acquiring the rental television set for his private use.

The rental service has great prospects. It is searching for and finding the most effective ways to the consumer. Under the 12th Five-Year Plan there will be a considerable increase in the volume of services rendered and progressive new forms of service will be introduced. Even today a good deal is being done in new direction of the party social policy. In particular, it is planned to open specialized rental points for agricultural equipment and instruments for constructing garden buildings in dacha areas. Here it is possible to rent a minitractor. At the beginning of the 12th Five-Year Plan there will be more than a thousand of them at the disposal of rental points throughout the republic.

The number of rental points will also increase. In Moscow during the past five-year plan 49 salons were opened and a considerable number of them were in new residential areas. Orekhovo-Borisovo, Marino, Biryulevo-Zapadnoye, and others. There are 12 specialized enterprises for renting children's items.

The opportunities in this sphere of services are increasing, but so are the requirements on its activity. In order to answer to the spirit of the times, it is not enough to increase the capacities and supplies; it is necessary to solve crucial organizational problems which are impeding its development. And they must be solved today.

The 22nd CPSU Congress set immense tasks for developing the sphere of services and rentals--a significant part of this most rapidly developing sphere. So far the volumes of rental services are tens of thousands of times smaller than the volumes of commodity turnover. It is necessary for this ratio to be radically improved. And then the rental point will become a natural partner of the enterprise that produces durable goods.

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RESULTS FROM INFRASTRUCTURE DEVELOPMENT SURVEYED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 98-108

[Article by A. O. Shabalin, candidate of economic sciences, Council for Study of Productive Forces Under the USSR Gosplan (Moscow): "The Effect of the Development of the Infrastructure"]

[Text] "In the current stage of the development of the economy problems of the production infrastructure have been aggravated. The arrears in transportation, communications, material and technical supply and other branches lead to large losses. It is necessary to search out additional possibilities in order to solve this critical national economic problem," [Footnote 1]--it was noted at the conference in the CPSU Central Committee concerning questions of accelerating scientific and technical progress. This same thing was discussed in the political report of the CPSU Central Committee to the 27th Party Congress: "The closest source for augmenting the food supply is the reduction of losses of products from the fields and farms during harvesting, transportation, storage and processing."

The following figures show the scale of the increase in the final product that can be obtained because of improving the infrastructure. Improvement of conditions for the storage of grain increases its final yield by 20-25 percent, and vegetables, fruits and potatoes--by 30 percent. Just the elimination of losses of mineral fertilizers during transportation and storage will make it possible to increase their useful utilization by more than 8 million tons, and cement--by 12 million tons.

Where is it more advantageous to invest funds--in the expansion of production or in the elimination of losses?

There are no such alternatives for perishable products. Expansion of the production of vegetables, fruits and potatoes without providing for high-quality storage of them amounts to pointless expenditures. The only possible way of increasing their consumption is to develop the corresponding elements of the infrastructure. A no less crucial problem is the elimination of losses of perishable products in the places of their consumption. This requires additional capacities at fruit and vegetable bases of large cities. But the construction of storage facilities is proceeding at slow rates (each year only

45-55 percent of the planned capacities are introduced), and the existing ones are overloaded. Thus in 1978 the load in the RSFSR exceeded the norm by 44 percent, and in trade organizations of 40 autonomous republics, krays and oblasts--2-3-fold. [Footnote 2] According to calculations of specialists, the construction of storage facilities in Moscow and Leningrad is 26 million rubles more economical than the expansion of the production of products, their storage and their delivery to the consumer.

Attention should be given to the positive experience of the city of Shakhta in eliminating losses at places of consumption. An annual average of 25,000 tons of vegetables and more than 8,500 tons of potatoes are shipped here. If products with excessive moisture content arrive they are dried at a temperature of 45 degrees for 48 hours on special platforms (on each one it is possible to dry up to 1,000 tons of vegetables at the same time) and then they are placed in storage. There are practically no wastes during storage because there are shops in operation for producing starch, canned fruits and vegetables, jams and so forth. In Orel and Bryansk special storage facilities were constructed at the beginning of the 1970's. The proportional expenditures on their construction were half that of standard construction, and the natural losses of products were one-fourth to one-fifth. Unfortunately this experience is practically not being disseminated. In our opinion, the difficulties are caused to a considerable degree by departmental separation. The ministries responsible for the construction of storage facilities frequently do not have enough funds for the introduction of new developments. It would be desirable to redistribute capital investments from agriculture into the construction of storage facilities at the places of consumption.

For other products it would seem that there are certain alternatives. For example, the kolkhozes and sovkhoses of the central regions of the RSFSR are poorly provided with storage facilities for mineral fertilizers. Because of the unsatisfactory conditions for storage, frequently up to 20 percent of the fertilizers are lost. In order to make use of all the fertilizers, two variants are possible: to provide the farms with warehouses or to make up for losses by increasing production. Which is more advantageous? Fertilizers are sent by rail to warehouses of Soyuzselkhozkhimiya and then by automotive transportation they are shipped to the consumer farms. According to the second variant it is necessary to take into account expenditures on production, rail and automotive shipments, the creation of additional capacities at the warehouses of Soyuzselkhozkhimiya, loading and unloading work, and also losses in shipment (up to 17 percent of the fertilizers are lost) and storage on the kolkhozes and sovkhoses.

According to our calculations, under these conditions the former variant is much more advantageous. For nitrogen fertilizers the economic effect reaches 242 rubles per one ton, phosphorus fertilizers--257 rubles, and compound fertilizers--172 rubles. [Footnote 3] Providing the kolkhozes and sovkhoses with storage facilities for mineral fertilizers will make it possible to save about 500 million rubles in the national economy, which would be needed in order to produce and deliver to the consumer fertilizers to make up for losses during storage.

The advantage of eliminating losses over expending production is not limited to this. Elimination of losses makes it possible to obtain an effect subsequently as well. What are we speaking about? Let us say that the supplies of a particular kind of ore amount to 5 million tons, the annual extraction is 400,000 tons, and the losses are 80,000 tons (20 percent). It is possible to provide for the consumption of ore in an amount of 400,000 tons by eliminating losses or by increasing the extraction by 100,000 tons. Expenditures on eliminating 1 ton of losses equal 3 rubles, and on extraction of this amount--4 rubles. In 10 years they will amount in the first variant to 2.4 million rubles ($80,000 \times 3 \times 10$), and in the second variant--4 million rubles ($100,000 \times 4 \times 10$). The elimination of the losses costs 1.6 million rubles less.

But this is not all. The effect from eliminating losses is also manifested beyond the calculation period. The fact is that with an annual extraction of 500,000 tons of ore, its supplies will be exhausted in 10 years. It will be necessary to change to a new deposit, with expenditures on extraction of 5 rubles per 1 ton. At the same time, according to the first variant in 10 years 4 million tons will have been extracted. Consequently, this deposit can be used for another 2.5 years. According to the first variant, expenditures during this period will be 4.6 million rubles [$(400,000 \times 4 + 800,000 \times 3) \times 2.5$], and the second variant--6.25 million rubles ($500,000 \times 5 \times 2.5$), that is, the elimination of losses costs 1.6 million rubles less. And this will be the subsequent effect. It is related to the savings on natural resources that arise with the elimination of losses. If it were not for these savings, when the minerals were exhausted it would be necessary to satisfy the need for them through costly imports; to change over from open pit mining of deposits to underground mining; to extract ores that are not as rich; to move the extraction of raw material to remote regions with high expenditures on transportation from extraction to the consumer, or to utilize more expensive kinds of minerals to replace the ones that have been used up.

What is the real amount of the aftereffect, for example, for coal of the Donbass? Coal supplies of Category AV will be exhausted in the Donetsk Basin in 60 years and the construction of new mines per 1 ton of coal will cost 25 percent more. A carload of this fuel on the way from the Donbass to the consumer loses a minimum of 2 tons in weight and therefore the effect from economizing on the best coal resources as a result of eliminating losses in shipment will amount to approximately 2.4 billion rubles.

The elimination of the damage will make it possible to save a considerable quantity of supplies of iron ore in deposits with open pit mining. Since the replacement of ore from underground extraction with iron ore concentrate from ores with open pit extraction will make it possible to save about 10 rubles per ton, and in rail shipments 4 percent of the ore is lost, the aftereffect as a result of economizing on the more valuable ores will be equal to approximately 600 million rubles.

In all, the elimination of losses during transportation will make it possible to save coal, ore, nonore raw material, cement and other bulk cargo worth a total of about 500 million rubles a year.

The possibility of increasing the final output through eliminating losses should be taken into account when determining not only the relative, but also the absolute effectiveness of capital investments. Academician T. S. Khachaturov notes that frequently the effectiveness of investments in the production infrastructure is calculated incorrectly, without taking into account losses from poor storage. In his opinion, capital investments in the infrastructure could expediently be compared primarily with losses which can be avoided as a result of these investments. [Footnote 4] The utilization of this approach radically changes our idea of the effectiveness of investments in the infrastructure. Thus capital investments in the construction of elevators, taking into account the effect from eliminating losses, are recouped in 3-4 years, vegetable storage facilities--1.5 years, fruit storage facilities--3 years, and warehouses for storing fertilizers--2 years, that is, 4-5 times more rapidly than indicated in the plan. [Footnote 5] Often the effectiveness of investments in the infrastructure is calculated separately for each object (warehouse, elevator, road). But it is necessary to evaluate the total expenditures (not only on a given object, but also on related ones that are necessary for bringing the increased output to the consumer). Let us assume that capital expenditures on the construction of a 20-kilometer highway in a rural area amount to 2 million rubles. The road helps eliminate the loss of 6,000 tons of potatoes. Taking this into account, the effect from investments in the road is equal to 500,000-650,000 rubles, which will be recouped in 3-4 years. The construction of storage facilities for these 6,000 tons of potatoes will cost 2.4 million rubles, and the total capital investments in the construction of the road and the storage facilities equal 4.4 million rubles. The shipment, storage and wholesale sales of the potatoes produce a loss for the wholesale trade enterprises. The losses are equal to 1.1 rubles per 1 ton of product, a total of 6,600 rubles. Consequently, the overall effect from investments in transportation and storage will amount to 493,200-643,400 rubles, and the period for recouping them will be 7-9 years.

The time period for recouping capital investments in the objects of the infrastructure we have considered in Table 1. In it initial capital investments are understood to be those that are made directly for the elimination of losses, and the subsequent ones--investments in the infrastructure that provides for bringing to the consumer the additional products formed because of the elimination of losses. From Table 1 it is clear that the time periods for recouping the initial capital investments in measures for eliminating losses increase taking into account the subsequent investments in the infrastructure. This is explained by the fact that most of the effect from investments in the infrastructure comes in the increase in output that is formed as a result of eliminating losses. Therefore the initial capital investments in the elimination of losses are highly effective.

But these are insufficient. Having constructed, say, an elevator and thus having eliminated losses of grain on the producer farms, but without having increased the handling capacities of the roads, we simply shift the losses from the sphere of production to the sphere of storage (since the grain will not be removed from the elevator). Therefore subsequent investments are needed in the transportation and warehousing network. In and of themselves they are frequently ineffective but, as a rule, they are recouped as a result of the effect from eliminating losses.

Table 1--Time Periods for Recouping Capital Investments
in Objects of the Infrastructure, Years

	(1)	(2)	(3)	(4)	(5)
Elevators	3-4	--	3.5-4.5	6-6.5	
Warehouses for foodstuffs	2.5	--	3	3-4	
Warehouses for mineral fertilizers	2	--	3	4	
Storage facilities for vegetables, fruits and potatoes	1-3	--	1-3	1.5-4.5	
Paved roads on grain farms	3-4	3.5-4.5	3.5-4.5	4-5	
Paved roads on potato farms	3-4	7-9	7-9	7.5-9.5	

Key:

1. Time period for recouping initial investments
2. Change in time periods for recouping investments, taking into account subsequent investments in
3. Storage at wholesale and station warehouses and elevators
4. Transportation from wholesale warehouses to consumers
5. Sale or storage by the consumers

A different approach to the evaluation of the effectiveness of investments in the infrastructure is justified when the increased consumption is provided through expansion of the production of products and bringing them to the consumers. Here it is necessary to measure the effectiveness of the total capital investments in the complex "production-infrastructure." The role of the infrastructure in this complex can be judged from its proportion of the fixed production capital (see Table 2).

Table 2--Structure of Fixed Production Capital in Branches
of National Economy, % of Total *

	1965	1970	1975	1980	1984
Infrastructure	28.3	27.7	27.0	26.4	26.0
Including:					
Transportation and communications	23.0	22.0	21.3	20.8	20.4
Trade, material and technical supply and sales, procurements	5.3	5.7	5.7	5.6	5.6
Industry	46.7	48.0	47.8	48.0	48.3
Construction	3.3	4.1	4.3	4.8	5.1
Agriculture, forestry and other branches of material production	21.7	20.2	20.9	20.8	20.6

* Calculated from: The USSR National Economy in 1980, Moscow, "Finansy i statistika", 1981, p 49; the USSR National Economy in 1984, Moscow, "Finansy i statistika", 1985, pp 59-60.

The proportion of the infrastructure in the fixed production capital of the national economy decreases as a result of transportation and communications. At the same time the proportion of fixed production capital of branches of the sphere of circulation have increased somewhat.

A more complete idea of the significance of the infrastructure is provided by the ratios between the fixed capital necessary for production and for bringing the products of individual branches of industry to the consumer (see Table 3). In the branches under consideration no less than 80 percent of the overall amount of fixed capital necessary for bringing coal, petroleum and petroleum products, ferrous metals and cement to the consumers is attributed to transportation and communications.

Table 3--Fixed Capital Necessary for Production and Consumer Delivery of Products of Certain Branches of Industry, % of Total*

	-----Branches of Industry-----						
	<u>Ferrous</u>		<u>Including:</u>		<u>Machine</u>	<u>Timber</u>	
	<u>Metallurgy</u>	<u>Fuel</u>	<u>Coal</u>	<u>Petroleum</u>	<u>Building</u>	<u>and Wood</u>	<u>Cement</u>
						<u>Processing</u>	
Fixed capital necessary for producing products	84.6	61.7	78.2	59.6	91.3	69.7	85.5
Fixed capital necessary for bringing the products to the consumers	15.4	38.3	21.8	40.4	8.7	30.3	14.5

* Calculated from: "Questions of Modeling Public Reproduction Under the Conditions of Intensification," Moscow, Rotaprintnaya of the Institute of Economics of the USSR Academy of Sciences, 1983, p 131.

The data that have been presented show the importance of accounting for the infrastructure constituent when determining the effectiveness of capital investments. But in investment measures, as before, priority is frequently given to production and the infrastructure ends up the loser. And this is not limited to the fact that a shortcoming or a shortage of investments in transportation and warehousing leads to losses during shipment and storage and underfulfillment of the production assignments. Because of the underestimation of the effect of the development of the infrastructure, facilities for transporting these cargo also have to pay fines for failure to fulfill the plan for shipments. For a failure to fulfill the plan to provide cars it pays a fine according to the cargoes whose shipment is planned in tons and railroad cars--a ruble per 1 ton of cargo. When shipping nonferrous metals the railroad receives 2,340 rubles in profit and pays 4,000 rubles for failure to fulfill the plan for the shipment of wood. The losses amount to 1,660 rubles. When shipping wood it receives 1,246 rubles in profit and pays a fine of 1,200 rubles. As a result, the profit is 46 rubles. [Footnote 6]

A failure to account fully for the infrastructure constituent when planning has led to an imbalance between the needs of production and the capabilities of transportation. But this is not all. It has turned out that wood is shipped first, and not the more valuable cargo--nonferrous metals. As a result, the national economy loses even more from this imbalance.

The situation is complicated when the infrastructure is underestimated simultaneously in terms of expenditures and in terms of effect. Let us say that it is necessary to ship 1,200 tons of nonferrous metals and 4,000 tons of wood. The cargoes are transported in standard four-axle cars, each holding 12 tons of nonferrous metals or 40 tons of wood. Consequently, the shipment requires 200 cars. The railroad, for example, can provide only 100 cars, that is, as many as are required for shipping either the metal or the wood. Which variant will it prefer?

To answer this question it is necessary to know the railroad's incomes from the transportation and warehouse system.

The railroad would be interested in preferential shipment of valuable cargoes with correct accounting for the effect from the production of products and their delivery to the consumer. Thus the total capital investments in the production of nonferrous metals and their transportation to the consumer is much more effective than analogous expenditures on wood. Therefore if one takes into account part of the effect from producing nonferrous metals in transportation tariffs (and if it is impossible to increase them, in subsidies for transportation), their shipment will be incomparably more advantageous than the transportation of wood.

Thus in order to correctly determine the effectiveness of investments in the infrastructure it is necessary to analyze them along with investments in production. Who will do this? In our opinion, economic decisions of an interbranch nature should be considered in the Stroybank, which has the most complete information about the future development of associated branches, expenditures on this development and the effect from it. This will give the Stroybank the opportunity not only to select the best variants of economic decisions, but also to substantiate the distribution of the total effect of the production infrastructure complex in such a way as to provide for profitability of all of its elements.

FOOTNOTES

1. PRAVDA, 12 June 1985.
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4. Khachaturov, T. S., "Effektivnost kapitalnykh vlozheniy" [The Effectiveness of Capital Investments], Moscow, "Ekonomika", 1979, pp 179-180.
5. "Increasing the Effectiveness of Public Production on the Basis of Intensification," Moscow, "Rotaprintnaya of the Institute of Economics of the USSR Academy of Sciences, 1984, p 104.
6. Calculated from: Economic Handbook of the Railroad Worker, Moscow, "Transport", 1978, part 1, pp 139-143; part 2, pp 198-203, 220-229.

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COMMENTS MADE ON SERVICE FOR METAL CONSUMERS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 109-122

[Letters with commentaries prepared by V. S. Lavrov: "Service--To Consumers of Metal"]

[Text] Many enterprises are experiencing difficulties with metal: delivery deadlines are not met, the products list is not observed, especially when speaking about small batches. What must be done in order to eliminate these difficulties? This is contemplated in a correspondence dialogue between two of our readers: B. I. Pekurovskiy, deputy director of the Sintez Combine (Kurgan), and V. Ya. Gerbrandt, former deputy director of an enterprise for delivering metal products of the USSR Gosstab (Pavlodar). Comments are made on the dialogue by the chief of the planning and economics administration of the USSR Ministry of Ferrous Metallurgy, R. Ya. Gugnyak.

B. I. Pekurovskiy: Quite recently I was working as director of the ZhBI-2 Plant in Kurgan and every day I would strain my brain over the problem of obtaining and utilizing ferrous metals. What the plant needed was a mere trifle from the point of view of the metallurgists--30,000 tons--but it required 30 kinds and it had to be delivered uniformly throughout the course of the year. Basically it was reinforcing bars used for framework for panel residential buildings. The quite simple problem was to obtain metal of the planned diameter. We had to replace it with a larger diameter because we could not use a smaller one: our structures had to be sturdy. If they were to collapse there would be legal consequences. This means that there was a constant overexpenditure of metal. Additionally, the labor-intensiveness increases, sometimes 2-3-fold: for the machines were built for the planned diameter and they must be readjusted, plus manual labor is added. The structures coming from the plant were usually heavier and more costly. As a result, there was a flow of complaints from the clients and the control agencies.

For me as the director this was not only unpleasant, but also a sore spot in all respects, including materially. But still it was necessary to accept any

kinds of replacement of metal in order to avoid idle time, so that the workers would have their earnings and bonuses, and so that they would not leave this production, which was difficult to begin with. In the personnel division there was no waiting line of people wishing to work, but the waiting lines for housing in the city did not decrease in size. And usually the plant operated with the metal that arrived or that was delivered at enterprises of the USSR Ministry of Ferrous Metallurgy. When collecting orders from us they demand that they be precise down to 1 (one!) ton, but they deliver metal with the precision of +/- 100 tons. If it is plus, that is not so bad: we set the 99 extra tons aside so that the control agencies do not discover them! It is worse when they fail to deliver any metal, which cannot be replaced. For example, there were interruptions in the delivery of 3VS and PS steel. The direct supplier, the Kurgan Metal Base of the USSR Gosplan, replied: "If you did not receive it, straighten this out with the Yuzhnouralsk Base." There they said: "Figure it out with the Chelyabinsk Metallurgical Plant." And at the plant everything was in order: "We sent it all, and if some brands did not arrive, we replace them with other metal." Who worries about 30-40 tons of necessary metal? Yet at the plant you cannot produce the products. Hundreds of tons of unnecessary metal are lying around unused, but they take away every shaving from the director as if he were going to build his own furnace.

How do we make the deliveries of metal reliable in terms of time periods, quality (products list) and quantity? In order to build a building (section, floor) one needs a complete set of metal. So let the Gosplan metal bases make up these sets and receive money for them, but the metallurgical plant should also receive money for complete deliveries to the metal bases. I am convinced that with this indicator--supply for the consumer--it would be possible to control our business dynamically and economically.

V. Ya. Gerbrandt: B. I. Pekurovskiy discussed the "excess metal" but did not write about the immense quantity of wastes. Thus at 10 Pavlodar enterprises for reinforced concrete items up to 20 percent of the metal goes to waste. I myself beat my head against the wall when working as chief of a reinforcement shop. In the Gosplan system I understood that nothing could be changed here: the metal bases receives 30 percent of all the metal according to the so-called "nontransit norm" and the transit norm (69 tons) goes directly from the metallurgical plant to the consumer. This is approximately 50 percent, and another 20 percent of the metal goes through the departmental warehouses of the main administrations, trusts and so forth. All distribution of metal seems to be handled by Gosplan organizations, but their products are on paper, and the consumers need metal with a certain length, a certain profile, a certain brand and a certain diameter. And everyone who receives steel creates a supply in any case. Many thousands of tons lie around without moving.

I do not think that any new indicators-criteria for evaluating the activity of the suppliers, intermediaries or consumers will change the situation. It is necessary to find some deeper solutions in order to join into one the interests of the enterprises that are economically dependent upon one another. The USSR Ministry of Ferrous Metallurgy, the USSR Gosplan and the metal-consuming branches. This apparently common goal of utilizing the country's metal supply more efficiently, these enterprises, for various reasons, what happens might be regarded as an "economic crime."

For example, in the production of those same reinforced concrete elements, and a large volume of them are produced in the country, a large amount of metal is used for them, and we have long been aware of the high economic effect of prestressed steel. And the metallurgists produce it (heat-hardened steel). But in the construction industry it is used in insignificant quantities because of the lack of the necessary technological equipment and the slow replacement of technological fittings. And the territorial Gosstroy agencies are unwilling to take this steel because of the small norms for its delivery. If all these obstacles were eliminated it would be possible to save 40 percent of the metal that now goes into reinforced concrete elements.

B. I. Pekurovskiy gave the example of the "blind alley" situation with the 3VS and PS steels which are used for hinges for panels of residential buildings. That is why it is called "hinge" steel. About 10 years ago the central scientific research institute under the USSR Gosstroy recommended using instead of this a new brand of steel that had been assimilated by the metallurgists and produces a savings as compared to the old brand of 35 percent of the consumed volume. But of the 10 enterprises in Pavlodar that were interested, only one (!) has assimilated the recommended steel over this long period of time.

Pavlodar is a small city and perhaps it is backward in some ways, but it seems that such examples can be found in many other cities. How do we explain the fact that many managers waste effort on finding old materials that have sometimes been removed from production? A lack of confidence in the new materials, a lack of desire to introduce them? I have never met any managers like these. But it is possible to understand managers who introduce new items, save on steel, but do not wish to have new forms of expenditure of it, since suddenly...the deliveries will be interrupted and there will be idle time at the enterprise, especially after they go through the circle of irresponsibility described by B. I. Pekurovskiy.

And it is not very difficult to break this circle organizationally. If one were to take a look at what the metallurgical shops of the plants of any branch are doing, in our case the reinforcement shops for the housing construction combine or the plants for reinforced concrete items, in principle these shops are not distinguished from one another. They have almost identical equipment on which they perform identical operations and from which they remove very similar items. But each "is dying alone," struggling with the same problems.

And when you look at these "torments" with metal, you think: Why not concentrate delivery, sorting and procurement of metal in the oblast center in one place--a large metallurgical plant? From here every enterprise would receive blanks of the necessary (planned) length, width and diameter and they would immediately be put to use in the basic shops. Saving metal in any enterprise with this kind of organization would be the same thing as running with a burning lamp on a sunny day. But now the numerous, most frequently poorly supplied metallurgical sections (they also exist in the basic shops), metallurgical shops and even entire productions at large enterprises have their own "regulations," their own various norms, and a mass of waste which

can be utilized at the neighboring enterprise, but now they are sent to the dumps.

A large territorial metallurgical plant would receive orders from consumers, unify the order to type sizes of metal, it would have stable ties with scientific research institutes, it could rapidly introduce new technologies and materials, and it would work hand in hand with metallurgical plants on a contractual basis. And only then would we have not a conventional, as is now the case, but an actual savings on metal. It would be equal to the difference between the quantity of metal ordered by the consumers and that received from them from the metallurgical plant.

It would not require additional equipment to create such plants for any of the chiefs of metallurgical shops at metal-consuming enterprises, for let any chief of a metallurgical shop at the metal-consuming enterprises prove that his equipment is loaded by more than 50 percent! In the second place, no additional workers would be needed. Those workers who are now employed in metallurgical productions would be enough for two complete shifts and possibly three. Moreover, at a combined metallurgical plant labor productivity would undoubtedly be higher than at any of the currently best metallurgical productions, that is, on the whole, less labor resources would be needed.

But who can take responsibility for this work which on the scale of the country means many billions of rubles' worth of savings, a reduction in the production of rolled metal, and the removal of millions of tons of supplies from all kinds of bases and warehouses, most frequently out in the open!

The Editors: V. Ya. Gerbrandt is the author of the plan for a metallurgical industry with the capacity of 25,000 tons of metal a year. The construction and organization of this production, according to his calculations, will be recouped in 12 months, under the conditions of Pavlodar it will not require increasing the number of workers, and it will cut in half the amount of technological equipment in operation at 10 enterprises of the construction industry. During the author's employment in the system of the USSR Gosplan his project did not evoke any interest with respect to this system. And the project is gathering dust in the Pavlodar Industrial Institute. The author has transferred to work in the branch supply system, but he has not lost the desire to carry out his plan with the help of oblast management agencies.

B. I. Pekurovskiy: Having read G. Ya. Gerbrandt's letter, I think that his plan is unrealistic with the existing conditions for delivering metal. These would have to be changed first. No difficulties at enterprises of the USSR Ministry of Ferrous Metallurgy can justify the violation of the products list for deliveries. An evaluation of their activity in terms of fulfillment of agreements gives only the appearance of concern for the consumers. A 100-percent fulfillment of the products list--all conditions for delivery should be linked to this.

Now about savings: even if there were a territorial metallurgical production, it would be necessary to leave the actual savings on metal at the metal-consuming enterprise for a certain amount of time. This would be a powerful incentive for the business manager. Now the Gosplan organization penalize

enterprises for above-normative residuals of metal by withdrawing capital. This would be logical if the plant received all of the kinds of the items within the necessary time period. But any overexpenditure takes place not because of our inefficiency, but by the fault of the metallurgists who do not give us the assortment of metal or in general don't give us some kinds of metal at all according to our orders.

And the third thing: it is necessary to unconditionally permit the exchange of metal among enterprises ton for ton. This is prohibited now. To be sure, they say that it is possible to go to Kurgan for permission to make exchanges in Chelyabinsk. But imagine two plants with a common fence under the jurisdiction of two different departments and they stand idle because of 3 or 4 tons of metal which they do not have the right to hand over across this fence!

V. Ya. Gerbrandt: Everything is not so simple here. After all, sometimes a ton of steel worth 130 rubles is exchanged for 180 rubles. Sometimes the difference in prices is even greater. And indeed they cannot sell metal to one another. In the Gosplan this is called "release of metal without funds" which is punished by a fine and a removal of funds corresponding to the quantity of metal sold. And I do not agree with B. I. Pekurovskiy who is inclined to see the root of the evil in planning. With 100 percent fulfillment of the products list, they could still send the unordered steel to the territorial base and the client would be forced to take it. While I have no personal complaints against the Gosplan, I think that its organizations, through which one-third of the overall volume passes, but which are in charge of all the funds for it, create a good deal of confusion in the distribution, redistribution and receipt of metal. For example, the one who produces rolled metal should also distribute it. And there could be a simple chain, with the minimum of all kinds of paperwork: the metallurgical plant--the regional metal procurement plant--the metal-consuming enterprise. There would also be scientific service according to the plans for the technical-technological, normative and other affairs. But the existing policy for distribution and delivery of metal, which is insisted on so stubbornly by the USSR Ministry of Ferrous metallurgy and the USSR Gosplan, does not produce appreciable results for the economic managers.

The Editors: We think that in the heat of their polemic both of our authors are exaggerating individual problems somewhat. Both the USSR Ministry of Ferrous Metallurgy and the USSR Gosplan during the past decade have transformed many of their enterprises, which are doing a much better job of supplying the branches with metal and rolled metal than they did 5 years ago. One can name many metallurgical enterprises that fulfill all of their deliveries. The Ukrainian SSR Gosplan, through which many of the organizations of the country pass, can be used as an example, as it were, a school of modern work with enterprises that consume metal. But from our standpoint, both B. I. Pekurovskiy and V. Ya. Gerbrandt are right in that such radical problems as compensation for losses caused by the supplier to the consumer and service for metal-consuming enterprises are still problems. And it is almost impossible to tell that there has been any progress here at the level of managers of enterprises. And since all roads lead to the USSR Ministry of Ferrous Metallurgy, let us try to clarify what position it takes.

Comments of the chief of the Planning and Economics Administration of the USSR Ministry of Ferrous Metallurgy, R. Ya. Gugnyak

Without trying to misinform anyone or to defend the "honor of the uniform," I would say, after reading B. I. Pekurovskiy's and V. Ya. Gerbrandt's letters, that planning in our branch, as in all of the national economy, is constantly being improved. At least in 1986 many of our work indicators simply could not be compared with what they were 5 years ago. What is most obvious here? For example, we have stopped measuring in physical tons. And, for instance, reproaches that the metallurgists are chasing after tons are simply groundless today. To accuse our enterprises of wanting to push the railroad cars outside the gates of the enterprise and that they do not want to know any more about them--this is a superficial point of view. Let us consider that same reinforcement steel. If it has been rolled at a diameter of 10 millimeters instead of 8, the rolling workers have lost money. The railroad car is full, but they have been given credit for conventional tons, taking into account the labor-intensiveness of the manufacture, and they have lost in the planning indicators as well as in earnings.

We are trying to save the consumers from the overexpenditure cost during the past five-year plan because of plus tolerances. Since we no longer use physical tons for measurement, it has become more advantageous to us to roll metal with minus tolerances. In 1986 the delivery of metal of smaller sizes increased, but in terms of mechanical characteristics (for example, durability) it is just as good as that which was ordered. The output of the economical kinds of metal products is also increasing. But...the consumers are afraid of losing funds and are extremely unwilling to accept the new products of the metallurgists.

In the letters to EKO there are references to the notion that our enterprises produce metal that is excessively long, and considerable quantities of it. But this is defective, and we keep it within the limits of a certain percentage. Excessively long metal is found outside our enterprises, somewhere in the Gosstab and branch bases where, possibly, they do not trouble themselves to deliver rolled metal of the proper length to the enterprises. The consumer has the right to refuse to pay for this kind of rolled metal. I wish to draw attention to this fact as well. They order measured metal from us, and then they cut it into pieces. This way the expenditures are increased both for the metallurgists and for the consuming enterprises.

But let us take another look at a railroad car loaded with metal. For some reason certain consumers think that it is more convenient for the metallurgists to package metal up to 10 tons--the idle time of the railroad cars is reduced and so forth, yet at many enterprises where the cranes can lift up to 5 tons, it is impossible to unload such packages. The department of technical control checks to make sure that the packager weigh the amount indicated in the order. But let me note that small packages reduce the productivity of our equipment, and is it not time for the consumers to be concerned about modern lifting mechanisms?

It is possible to give many more examples that show that when planning within the branch the interests of our consumers are not so secondary as they may seem, and that they are taken into account as much as possible. For one of the main indicators is product sales, taking into account the fulfillment of agreements. And it--believe it or not--works. Five years ago we may not have been able to find a single metallurgical enterprise that fulfilled the orders according to agreements by 100 percent. Today there are more and more of them. In 1986 our branch abandoned the practice of evaluating their enterprises generally according to the assortment. The goal is to fulfill each position of the order. And the level of fulfillment of the orders during 7 months of 1986 was 99.2 percent, which greatly exceeds the level in other branches.

But, frankly, the branch is suffering because of the small sizes of the batches of metal. Is it conceivable to have 150,000 kinds of metal?! Look into the portfolio of orders, especially from plants that produce specialized steels. There one can find orders that are measured in kilograms. These are the kinds of orders with which the warehouses of the metallurgical enterprises are crammed. The finished product lies around for months waiting until a full carload is collected for consumers in one region. I can show you only in the direction of the USSR Gosplan. As early as the 1930's "metal sales agencies" were formed, which had a ramified network of bases throughout the country and could control even the present chaos that is created by small batches of metal.

B. I. Pekurovskiy is right when he says that 20 or 30 tons of metal can sometimes become an insurmountable problem. But he is wrong about the supplies of metal at the enterprises. They should not have a single ton of it! I personally cannot understand the desire of Gosplan organizations or control agencies to punish the managers for above-normative supplies of materials. Just take them to the special bases, sort them, and offer them back by letting them call for them themselves or with the help of special machines that belong to the Gosplan, but only that which they need for this hour, day or month! If the metal is not the right kind or if they have taken too much--it should be returned to the base. This simple system is not working now. And the managers of metal-consuming enterprises, of course, are doubtful--will they be able to obtain what they need from the base at any time? This pertains also to our small batches of metal.

I frequently meet with representatives of the press. Some of them are well aware of the state of affairs in our enterprises. But, perhaps, EKO will say that the USSR Ministry of Ferrous Metallurgy and its enterprises does not handle the sales of its products. This function was taken from us long ago by the USSR Gosplan, where this matter is handled by several times more people than we have on the administrative staff of our ministry. And the result is that the system of planned distribution of metal does not work either. This is not an undermining of the USSR Gosplan; it is a fact that is obvious to everyone, including your authors. But is it necessary to have an intermediary between the supplier and the consumer? Would it not be better to work directly? Would the utilization of metal in the country not improve? For today we produce more of it than anyone else in the world and per ruble of national income we expend 240 grams of metal (the United States--56). We have

determined that other developed industrial countries have approximately the same proportion.

The procurement plant in Pavlodar suggested by V. Ya. Gerbrandt and the network of these plants throughout the country is a promising idea, but not a new one. In the world there are hundreds and perhaps thousands of specialized firms that deliver to the plants blank pieces with any configurations, length and width, and from any kind of steel. These are blank pieces that do not require metal cutting, welding or any other kind of processing. This idea has been discussed for a long time in directive agencies. And there are two questions: who will be responsible, and how will this be done? The simplest thing is again to point in the direction of the USSR Gosnab: it can take charge of the sales and let it also handle the service for the consumers of metal. If this were to be done it would not be by the Ministry of Ferrous Metallurgy, whose task it is to produce metal in one form or another. Why should the branch also prepare it in the form of blanks suitable for assembling machines or elements? And it cannot manage this work by itself. Perhaps it should cooperate with other ministries? Perhaps we should begin not with the union ministries, but with the republic ones? Perhaps we should begin with local industry, where there is also a good deal of initial metal processing in the metallurgical shop and sometimes it is very primitive (the finished blank piece)... But this would require breaking down the system of material and technical supply and moving a mass of material and human resources. Here it is necessary to think very hard before doing anything. And you have different viewpoints. Just try to take away the metallurgical production from VAZ! And it should not be taken away, for there it is practically an immense metallurgical plant.

As far as I can see the Ministry of Ferrous Metallurgy is not against such an idea and is not against carrying it out. But today it is very difficult to answer the questions: "Who and how?"

From the Editors

At the various levels of the USSR Ministry of Ferrous Metallurgy, the USSR Gosnab and many other higher levels of management of the national economy, for example, on Kalinin Prospekt and the USSR Ministry of Heavy Machine Building, you will not find any specialists who are satisfied with the policy for handling metal and metal products. Moreover, many think that it is necessary to radically improve the system for supply of metal, without which even a person who sees nothing except paper cannot work. In his plastic ball point pen is a steel ball.

In the offices of the ministries they know a great deal, but there is no clarity about where the enterprises should obtain metal. Why? The enterprises draw up the so-called "Specifications" for metal and give them to the territorial agency of the USSR Gosnab, whence this paper travels to one of the main administrations of the powerful organization, where there is a "dividing up, distribution and assignment of funds." Women are in the absolute majority there. They know a lot, but they receive little. Few men are capable of living on these wages and at the same time keeping in their memory dozens of enterprises and thousands of positions. Of course women are

also in charge of the electronic typewriters and computers, but if everything that comes into the hands of the Gosplan women were entered into them at once, it would be necessary to double the capacities of the USSR Ministry of Ferrous Metallurgy in one year....

The "Specifications," the primary document of the need for metal, plays a fairly specific role. The USSR Gosplan does not have the right to make any changes in this document. When collecting these specifications the main administrations of the USSR Gosplan, apparently, could find out the needs of the enterprises for metal and determine the possibility of satisfying them, but here we have "aerobatics." The Gosplan has applied an innovative device: it has established direct ties between the consumers and the suppliers.

It would seem that anyone could understand what a direct tie is. But if men and women were changed over to direct ties in the Gosplan understanding of this concept, there would be no children. The women in the USSR Gosplan are apparently the most enterprising of all: they send the person who wishes to obtain metal along with his specifications to the metallurgical plant, and here it is important not to make a mistake--it is possible to send him somewhere where metal of this brand has never existed and where they do not make it. The consumer coordinates and reveals the capabilities of the supplier and actually draws up "Specifications No 2." And on the basis of this there appears the "fund"-order for obtaining the metal.

In a less enlightened time the ties would have been more complicated: the enterprises would have submitted the specifications to their home ministry. There they would have a much better idea of how much and what kind of metal was needed, and through "powerful" administrative devices that would have replaced the kinds of metal that are in short supply with those that are not, they would have forced the enterprises to accept more economical kinds of metal products, and they would have advised them not to "put pressure on" the specialists of the USSR Ministry of Ferrous Metallurgy and in difficult cases, if they did not find a common language, they would summon for arbitration the USSR Gosplan, the USSR Gosplan (on the off chance that they could produce metal from their supplies without the Ministry of Ferrous Metallurgy) and the USSR State Committee for Science and Technology ("help to scientifically substantiate and decide; you have many intelligent minds in the institute"). The times were difficult and they had no understanding of direct ties. It was an emergency if suddenly instead of ordinary metal the enterprise used low-alloy metal. Now they have become richer: in the Gosplan they say complacently: "But why do you need ordinary metal? Take alloy metal! The limit must be met!"

I have in my hands an order for a carload of metal, but there is no way they can fill my order in Chelyabinsk. Naturally, I enter the confusing corridors of the USSR Ministry of Ferrous Metallurgy and ask them to give me a carload in Cherepovits, Nizhnyy Thil or somewhere else. Everywhere they tell me: "We do not have the right to do this." Even the minister cannot turn my order over to another plant. The Gosplan women, even without their electronic tricks, do this very quickly, but I slip back into old patterns again.... "Soyuzmetall," "Soyuztrubsnabsbyt," "Soyuzogneuporsnabsbyt," "Soyuzmetizsnabsbyt," "Soyuzkoksokhimsnibsbyt".... Endless addresses where

specialists of the USSR Ministry of Ferrous Metallurgy must visit, filling out orders for coke, refractory materials, iron, ferrous alloys, ingots and so forth and so on, which are produced at their enterprises. Why do we need an intermediary in the form of the Gosplan between me and the metallurgical plant when I need a carload of metal? Elektrostal will never send me 5 tons of steel unless the Gosplan workers find dozens of other consumers in my region. Then they will send the carload and we will send dozens of trucks and pick up our specialized steel. And it is much more difficult for the metallurgists when it comes to ferrous alloys, coke and even molding sand: the enterprises have their own, but the intermediary will not documentarily allow them to utilize it--they do not dare touch it.

Let us look at one document which was read and studied in the USSR Ministry of Ferrous Metallurgy, the USSR Gosplan, the USSR Gosstat and other involved administrative staffs, but so far no decision has been made on it.

"The existing system of providing the national economy with metal products ... does not make it possible to achieve effective utilization of metal... effective utilization of metal...effective utilization of the capacities of ferrous metallurgy enterprises.... The majority of consumer ministries practically do not know and do not monitor the needs of their enterprises for metal.... We have lost control over the expenditure of metal.... Today in the main sales administrations of the USSR Gosplan there is an accounting for the orders that are submitted in terms of labor-intensiveness or in terms of the need, which makes it impossible to efficiently load the capacities of the rolling mills, the thermal, purification and other means of processing metal, or to organize the filling of orders with economical kinds of rolled metal.... Today the loading of capacities of ferrous metallurgy enterprises is done by organizations who have no responsibility for their correct utilization or for fulfillment of the plan for production and deliveries.... The USSR Ministry of Ferrous Metallurgy does not have the opportunity to promptly reveal structural advances in metal consumption and cannot determine the future directions of the development of the branch or take into account the needs of the national economy for metal products, although according to the provisions concerning the USSR Ministry of Ferrous Metallurgy it bears responsibility for this...."

The author of this memorandum, which passed through many hands like a detective novel, told me:

"Perhaps you can use it. The essence is that neither the USSR Gosplan nor the USSR Ministry of Ferrous Metallurgy nor the metal-consuming branches are prepared for radical solutions. And certainly not for creating metallurgical plants. What will change if one fine day the USSR Gosplan disappears, along with all of its main territorial administrations? I think that nothing will. The Gosplan people will disperse among the various enterprises and ministries, strengthening their sales and supply services, and the warehouses will be turned over to the people who should be in charge of them. What would change if the USSR Ministry of Ferrous Metallurgy were to disappear? Also--nothing.

Then the metallurgical enterprises would be forced to look for consumers and would have real direct ties instead of the current ones which are strictly on paper or 'underground.'"

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MINISTRY RESPONDS TO ARTICLES ON PRIVATE AUTOMOBILES

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 132-136

[Article by V. I. Konovalov, deputy minister, USSR Ministry of the Automotive Industry (Moscow): "Automotive Service Under the 12th Five-Year Plan"]

[Text] The Ministry of the Automotive Industry has considered the selection of articles on questions of the use of motor vehicles and the responses these articles evoked from readers of the magazine, and it announces the following.

In spite of measures that have been taken, the level of technical service, repair and production of spare parts that has been reached does not meet the demands of the automobile owners. In the opinion of the Ministry of the Automotive Industry, the reason lies not so much with the structure of the management of automotive service, which is constantly being criticized, as with the shortage of production capacities in the system of automotive service and the shortage of spare parts, as the result of which conditions have arisen for abuse, extortion, rudeness and other negative phenomena. The fact that local party and soviet agencies have not paid enough attention to the development of this important sphere of service to the population has also contributed to this. After directive instructions concerning the need to improve automotive service, the Ministry of the Automotive Industry took measures for accelerating the development of automotive service capacities, increasing the production of spare parts, mainly those that are in short supply, improving the quality of services and the art of service, and stepping up the fight against negative phenomena.

As a result, during 1983-1985 in the country as a whole the volume of consumer services in the system of automotive servicing increased by 38 percent from 347 to 480 million rubles) while the number of motor vehicles increased by 15.7 percent. But in spite of the growth of consumer services and the production of spare parts, we are not fully satisfying the need for automobile tires, gaskets, hoses and other items that are produced in quantities less than the normative need by the Ministry of the Petrochemical Industry; batteries--the Ministry of the Electrical Equipment Industry; engine parts for the Moskvich automobile--Ministry of the Aviation Industry; parts for the front suspension and brakes of the Moskvich automobile--the Ministry of Machine Building; single pigment paints for painting automobiles--by the

Ministry of the Chemical Industry, and so forth. Throughout the Ministry of the Automotive Industry they are not fully satisfying the need for pistons, piston rings, bushings for repair, oil deflector caps for Zhigulis, oil filters, ball bearings for Moskvich automobiles, crankshafts for Zaporozhets automobiles, and so forth.

Under the 12th Five-Year Plan measures are envisioned for developing a network of automotive service stations and increasing the production of spare parts and auxiliary materials. During the 5 years it is intended to invest more than 500 million rubles' worth of capital investments in the construction of new service stations and warehouses for spare parts. It is intended to construct a total of 666 stations, including 379 in the system of the Ministry of the Automotive Industry. Additionally, it is intended to reconstruct and technically reequip existing enterprises and also to rearrange nonresidential premises for the needs of automotive service. Technical service will be organized in cooperative garages and parking lots with 50 or more automobiles.

Thus by the end of the 12th Five-Year Plan we should have created capacities capable of fully satisfying the needs of automobile owners for automotive services.

Concrete assignments have been set for the Ministry of the Automotive Industry and other ministries for increasing the production of spare parts both in terms of volume and in terms of assortment. In order to increase the motivation of the enterprises to produce spare parts for passenger cars, they are included in the category of consumer goods.

In order to satisfy the demand for spare parts for passenger cars, the Ministry of the Automotive Industry has additionally enlisted for their production the ZIL, KamAZ, AvtoUAZ and other production associations. The volume of restoration of worn-out parts, components and aggregates in 1986 amounted to 45 million rubles, and in 1990 it will have increased to 120 million rubles. For these purposes the Ministry of the Automotive Industry is purchasing additional equipment for producing spare parts that are in increased demand and it is continuing to construct plants for restoring parts, components and aggregates. Plants of the Ministry of Heavy and Transport Machine Building, the Ministry of Power Machine Building, and the Ministry of General Machine Building are to produce spare parts valued at about 40 million rubles in 1986 and 80 million rubles in 1990. The shortage of certain parts (bushings, pistons, piston rings and so forth) will also be overcome through other means even this year. This will make it possible by 1990 to satisfy the normative demand for spare parts for passenger vehicles belonging to citizens.

The Ministry of the Automotive Industry agrees with the opinion that it is necessary to create a centralized system for releasing outdated vehicles for payment, and has developed special "Provisions Concerning the Policy of Acquiring From Citizens Passenger Automobiles That Can No Longer Be Used," which should stimulate the writing off of old motor vehicles with worn-out bodies and the updating of the automotive fleet, since it stipulates that when an old motor vehicle is turned in the owner has the right to be first in line to acquire a new one, with the value of the old automobiles subtracted from the price. After the coordination and approval of these provisions, in

conjunction with the USSR Ministry of Justice, the USSR Ministry of Internal Affairs, the USSR Ministry of Finance and the USSR State Committee for Prices, it will be published.

Regarding the question of the organization and development of firm service of automobiles, one must say that this is a progressive kind of organization of repair, service and provision of spare parts for the automotive fleet. Firm systems for technical service of passenger vehicles have a number of advantages over unified technical service systems since they make it possible to obtain information about the way motor vehicles operate and the quality of their manufacture, and to promptly eliminate design and technological shortcomings that are revealed; the production associations have more responsibility for technical servicing of passenger vehicles.

A shortcoming of the firm system is the lack of the possibility for passenger vehicle owners to provide for their servicing at all stations, regardless of the make of the automobile, which, in a number of cases, leads to losses of time and so forth. As new stations are constructed this shortcoming will gradually be eliminated.

As concerns the planning of the activity and development of the automotive service system, this is being done on the basis of the needs of the passenger vehicles, taking into account the predicted increase and on the basis of normatives established by the USSR Gosplan. In keeping with these normatives the existing level of satisfaction of the demand for automotive services in 1986 will be 68 percent and it will be increased to 100 percent by 1990.

The basic planning indicator--the volume of consumer services for automotive service--reflects fairly precisely the population's need for repair and technical servicing of passenger vehicles, although it is not without shortcomings. Indeed, in the quest for volumes of consumer services, large amounts of work at technical service stations (STO) are becoming preferable, and small ones disadvantageous. In order to make it advantageous for STO's to perform minor jobs, special sections are being organized for minor, immediate repair, with a simplified procedure for filling out orders and keeping accounts. As the production capacities develop, the volume of minor services at STO's will also expand. To do this it is necessary for economic science to develop a planning indicator for the work of automotive service which, in addition to large jobs, would also provide incentive for small services as is suggested in the article by O. D. Markov (EKO, No 5, 1986).

We agree that it is necessary to increase the material incentives of the masters, technologists and other STO personnel for improving the results of the work of the enterprise as a whole. Experiments with including engineering and technical personnel in brigades are being conducted at individual STO's, and as experience and positive results are accumulated, this experiment will be extended within the automotive service system.

Regarding the coordination of the production of motor vehicles with the volume of output of spare parts, one can say that beginning in 1988 the deliveries of spare parts to the retail supply should be made in keeping with the normative demand for each automobile. In order to provide for regular deliveries

throughout the entire planned list, it is intended to create a network of firm warehouses of spare parts that are equipped with modern computers, for which more than 150 million rubles' worth of capital investments are being allotted, and a system of control of spare parts is being organized. This will make it possible to eliminate shortages and to improve the supply of the consumers with a simultaneous reduction of above-normative reserves.

One of the indicators of the quality of service is the "accessibility of services," in other words, the losses of time of automobile owners in looking for STO's, the filling out of orders, waiting for the work to be done, and receiving the automobile. In order to reduce these losses of time, in the system of automotive service of the Ministry of the Automotive Industry they are introducing into practice a preliminary record of service or repair with an indication of the time the automobile is received, and also subscriber service. Centralized dispatcher points in large cities send the client to the least busy station. Special sections are being created for minor repair, washing, mounting and balancing of wheels, and so forth, which does not require filling out an order; the working conditions of the STO's are being changed so that the client can fill out the order during nonworking time.

Owners can service their own cars both in their own garage and at service stations. The first form of self-service is the most widespread. It will expand rapidly. Self-service as a kind of service at the STO has been organized as an experiment at a special automotive center of AvtoVAZ in Tolyatti. During the summer self-service posts are also organized at certain stations in the Ukraine. But this kind of service has not become widespread because of the shortage of production capacities and the small amount of economic advantage. The utilization of a work post at an STO with a staff handyman is several times more effective than renting the work post for self-service. Nonetheless, as the production capacities in the automotive service system increase, the Ministry of the Automotive Industry will be developing this kind of service.

Concerning rental of passenger vehicles. As the readers correctly note, past experience has shown that car rentals encountered a number of difficulties that were insurmountable at the time. At the present time a whole number of the obstacles on the path to rentals have fallen away (the shortage of automobiles for sale to the population, the absence of a network of service stations). But some of them are still there. These include, for example, the shortage of individual kinds of spare parts. Taking into account the fact that under the current five-year plan the needs of the population for spare parts should be satisfied, it would seem to be expedient to return to the question of organizing passenger car rentals.

Summing up the results, one should say that complete satisfaction of the needs of the population for technical service and repair of passenger vehicles will require active and coordinative work on the part of a whole number of ministries and departments, enterprises and organizations for constructing

service stations, increasing the production and regulating the distribution of spare parts, improving the organization of automotive service, and improving the quality of work and the art of service.

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NEW CATERING SERVICES DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 137-139

[Article by V. S. Sominskiy, doctor of economic sciences (Leningrad): "Catering"]

[Text] I became acquainted with this new form of public catering more than 3 years ago when I was traveling through Finland on vacation. Once on the dinner table instead of plates there appeared an elegantly decorated box warmed to a temperature of 60-70 degrees which contained beefsteak and garnish. There were boxes with a fish dish, meat dishes and various garnishes for them. This kind of meal service is called catering. It is difficult to find a precise translation. But the idea is this: public meal service based on dishes (breakfasts, lunches and dinners) manufactured in factories, stored in boxes in the refrigerator and warmed in the same boxes before the food is served.

The technology of preparation for catering has a number of blocks or subsystems. The first block is the preparation of the meals at the enterprise which receives the semiprepared meat and fish, vegetables, fruits, spices and green products. The second block is the manufacture of special containers mainly of cardboard that is coated (laminated) on both sides with polyethylene, either with a layer of aluminum foil or without one. The boxes have attractive printing on them and are of standard sizes. The third block is specialized transportation. In containers the boxes with the prepared meals are taken from the plant to the wholesale refrigeration base, and from the wholesale base--to the place of consumption. And, finally, the fourth block is the organization of the meal service. Here all one needs is a steam table, plastic or ordinary (it is better to have plastic, disposable ones so that they need not be washed), knives, forks, spoons, tables, chairs and one worker who is capable of feeding hundreds in a minimum amount of time. And the quality of the food is guaranteed by the manufacturer. It would seem that catering could help in solving crucial problems facing public meal service.

[Footnote 1]

Where can catering be used? Anywhere where people want to have a quick, tasty meal without any fuss. And also where a diet is needed. In other words, in all types of dining rooms and cafeterias. At enterprises, in institutions, in

schools and kindergartens, in dormitories, in hospitals, at railway stations, on trains and in long-distance buses, for the drivers on long-distance trips, and on ships. We use something similar on plane trips that last more than 4 hours. But it is only "similar" for what Aeroflot offers is a long, long way from normal catering.

An elementary calculation shows the outstanding national economic effectiveness of catering. Savings in the preparation of food products (compared to small, old-fashioned dining rooms and factories) will amount to millions of tons, and the quality of the food is incomparably higher. Moreover, nothing is left for "pilferers" or any kinds of machinations which, alas, sometimes occur in public catering. Hundreds of thousands of public catering workers would be released for other sphere of service. Incidentally, the best of them could find an outlet for their capabilities in cafes, restaurants, and factories for preparing food and semiprepared food products. A large national economic savings would be achieved in the expenditure of fuel and energy. Millions of square meters of space taken up by kitchens and subsidiary facilities would be freed.

One should not think that catering detracts from the diversity of food or the art of good cooks. Of course not. Its application essentially improves the possibilities of developing restaurants, cafes and specialized food facilities (for Russian ravioli, pizzas, shashlich and so forth). Under the condition that the food will be tastier in all of these establishments.

Of course certain expenditures will be required in order to put the system into operation. But they could be recouped in a matter of months.

Above we discussed the directly calculated economic effect. But in addition to this catering creates, I dare say, a gigantic social effect which in one way or another is transformed into an economic effect, mainly in the growth of labor productivity.

Why is it that catering has not become widespread in our country and many do not know about it at all? In our opinion, there is only one reason: nobody is in charge. For public catering in its current forms (USSR Ministry of Trade) it is not typical to have factory manufacture of prepared meals. The food industry has not been adapted to this. The problem of containers and cardboard for them is quite foreign. Added to this is specialized transportation, storage, thawing, forks, knives....

The agency in charge of this could be the state agroindustrial complex, for what we are speaking about is the final product of the agricultural industry. Of course, with the participation of the Ministry of Trade, the Ministry of the Pulp and Paper Industry and the corresponding machine building and construction ministries and automotive transportation. This could be tested in one or two large regions of the country or in oblasts or republics. It is a worthwhile cause.

FOOTNOTE

1. See, for example, the article by B. G. Shelegeda, "What Can Public Catering Do: Tasks and Prospects," EKO, No 12, 1985.

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STREAMLINING DIRECTOR'S WORK DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 139-140

[Article by I. V. Unzhakov (Chelyabinsk): "From the Director's Desk"]

[Text] In the practice of consulting I was once given the task: to free the director's desk of the majority of incoming documents. Up to 40 documents came to him each day, and he spent up to 3 hours reading them, thinking about them and writing resolutions for the workers. An analysis of the content of the documents show that almost all of them could be sent to deputies or assistants.

We went through the mail along with the office workers a couple of times and established that only two or three documents should be addressed to the director. We began to introduce the new technology for distributing documents with a brief class with the deputies and assistants on sorting out mail from the director's file. The consultant read a brief paragraph from a document and those in attendance responded with the word "mine" or "for me." Then they were asked a question: "Do you know what to do with these documents?" The answer was in the affirmative. As a result, it turned out that there was no practical need for the director to make a resolution. They mutually agreed to begin to work with documents without resolutions, but under the condition that each day at the end of the work shift everyone would go to see the director and give him information about their content. They were allotted 5 minutes each for this. There were six participants. The total expenditures of the director's time on obtaining information in oral, summary form amounted to 30 minutes, and after a month they began to compress it into 15-20 minutes. And as a result he began to spend about 50 minutes on processing incoming documents, so we managed to save about 2 hours of the director's time each day.

At the same time the processing of the incoming documents became more efficient, and, the main thing, they were acted on more quickly. The director's assistants thought that communications only about documents that had been received would seem somehow inefficient and they began to do more work on them and bring in prepared decisions regarding these documents. A prompt evaluation of the quality of the decisions that were made and a word of

approval from the director provided incentive for improving the quality of the decisions that were made. The consultant recommended to the director that he make an evaluation and approve the decisions that were made.

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CHANGE IN FUND-FORMING INDICATOR ADVOCATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 140-144

[Article by I. B. Tadyka, chief of the planning and economics division of the Odessa Port Plant: "Modifying the Fund-Forming Indicator"]

[Text] An important role in increasing the effectiveness of production and improving the quality of work is played by the fund-forming economic indicators of the activity of the enterprises, the level of whose fulfillment determines the amount of the incentive funds for the enterprise.

I should like to share my opinion on the way one of these indicators--the proportion of products of the highest quality category (VKK products) operates in practice and what influence it has on production. In EKO No 7 for 1984 this question was raised in an article by the deputy director of the Balakov Machine-Building Plant imeni F. E. Dzerzhinskiy, I. Ya. Shteynbok, entitled "How To Curb the Hidden Indicator." In it the author discussed the difficulties encountered by the plant's collective when fulfillment the planned assignment for the proportion of VKK products in the overall volume of production and how this indicator automatically hampers the collective's efforts that are directed toward the development and introduction into production of new types of machines that are produced at the enterprise. As a solution to this problem I. Ya. Shteynbok suggested, instead of the portion of VKK products in the overall commodity or normative net output, utilizing as a fund-forming indicator the "volume of production of VKK products" in monetary terms.

We have encountered similar difficulties at our plant, but we envision a somewhat different solution. The Odessa Port Plant imeni Komsomol Ukraina is a modern, highly productive automated chemical enterprise that was created under the 10th Five-Year Plan for producing and processing mineral fertilizers. From year to year the plant regularly fulfills the plans for indicators of commodity output, VKK products and the proportion of VKK products in the overall volume of production. But in 1984 the fulfillment of the plan for production of products that are not subject to certification but which have a high demand among the consumers led to a failure to fulfill the plan for the proportion of VKK products while all the rest of the technical and economic indicators were met.

Such a situation can arise at any enterprise and it can entail a reduction of deductions into the incentive funds and thus influence the entire system of material incentives for the labor activity of the collective. To be sure, for the sake of fairness it should be noted that there are instructions approved by the USSR Gosplan, the USSR State Committee for Labor and Social Problems, the USSR Ministry of Finance and the AUCCTU of 20 August 1979 concerning the policy for calculating the economic incentive funds and bonuses for workers of enterprises and associations that have limited capabilities of above-plan output of products in the highest quality category. These instructions regulate the right of the ministries and departments of the USSR and also the councils of ministers of the union republics, with the agreement of the corresponding trade union organizations, to permit enterprises and associations not to reduce the amount of the economic incentive fund for a failure to fulfill planned assignments for the proportion of VKK products if there is an overfulfillment of the plan for production of products that are not subject to certification but are in high demand among the consumers; and to increase the amounts of the incentive funds for overfulfillment of plans for volume of production. But in practice, the documentation of such permissions frequently takes a great deal of effort on the part of the enterprises. And why adopt a special decree that smooths out the negative effect of an imperfect indicator? Would it not be better to replace this indicator with a more objective one?

In our opinion, it would be incorrect to utilize the "Volume of Production of VKK Products" in monetary terms as a fund-forming indicator, and this would not produce the desired results. As a result of the fact that this indicator is formed on the basis of a concrete list of products and a planned volume, it does not reflect the dynamics of the structure of the products produced by the enterprise. Therefore it can in no way be a stimulus for improving the quality or expanding the assortment. A situation might be created in which it would be sufficient for the enterprise to fulfill the plan for the production according to an established products list in order to deduct the maximum amount into the funds. This indicator lacks the main thing it is called upon to do--it does not motivate the labor collectives to utilize the enterprise's internal reserves more extensively for improving product quality or expanding the assortment of products that are certified in the highest category. No, here another volume indicator is needed, one which would objectively reflect the dynamics of the structure of the products that are produced and would stimulate the activity of the labor collectives that is directed toward improving product quality and increasing the volume of production.

In our opinion, this indicator could be the indicator of the "proportion of VKK products in the volume of commodity or normative net output subject to certification." There are provisions according to which any kind of product, depending on the type and the time since the beginning of its assimilation, is classified as a product that either is or is not subject to certification for a quality category. Each enterprise keeps track of product subject to certification and information about this is included in the statistical report of the enterprise on form No I-P--monthly. Thus in practice the calculation of the proportion of VKK products and the overall volume of products subject to certification would not take any special work.

Let us take a look at how this indicator behaves under the conditions of expansion of production, using our plant as an example. In 1985 a large-tonnage set of equipment for producing carbamide with a capacity of 330,000 tons a year went into operation at the plant. The raw material for the new production is liquid ammonia produced at the plant, which in and of itself is a final product that is sold on the outside both for export and for our country's agriculture. Since 1981 the liquid ammonia has been certified in the highest category. Since that time the proportion of VKK products in the volume of commodity output annually amounts to no less than 85 percent. With the startup of the new shop and the diversion of some of the certified products for internal consumption, the proportion of VKK products in the overall volume of production barely reaches 69 percent while the proportion of VKK products in the volume of products subject to certification amounts to 99.8 percent and will actually reflect the dynamics of the change in the structure of the products produced by the enterprise. In other words, the amount by which the volume of VKK products decreases because of objective factors, is equal to the amount by which the volume of products subject to certification decreases, and the previous proportion remains.

The proportion of VKK products in the volume of commodity output or normative net output in a number of concrete and frequently encountered cases will be subject to reduction. Let us clarify precisely which ones: a) in the event of overfulfillment of the plan for the production of products that are not subject to certification with limited possibilities of overfulfilling the plan for production of VKK products; b) in the event that with the startup of a new production some of the VKK products, which are raw material for the new production) will be removed from the commodity output; c) with the increased volume of commodity output as a result of the production of new products, whose time of assimilation is determined by the corresponding provisions. During all of this period the proportion of VKK products will be lower than planned.

There are probably other situations that show the imperfection of this indicator, but the ones presented here are the most typical and most frequently encountered. The indicator of the proportion of VKK products in the volume of the products subject to certification does not have these shortcomings.

Let us consider the change in the indicators under consideration in the event of expansion of production using our plant as an example.

With a plant increase in indicator (1), indicator (2) is subject to fluctuations caused by the assimilation of new kinds of products. And if one were to compare indicators (3) and (4), we would see that indicator (4) is not subject to such sharp changes since it is not influenced by the beginning of the output of new products which in the initial stage of output are classified as products that are not subject to certification.

Thus, having used as a fund-forming indicator the proportion of VKK products in the volume of products subject to certification we avoid negative aspects presented above and at the same time we acquire an effective lever that

motivates the labor collectives to increase the volume of production of VKK products and expand their assortment.

Table--Dynamics of Indicators for Various Years of Introduction and Assimilation of New Production Capacities (In Keeping With the Plan for Socioeconomic Development for the 12th Five-Year Plan):

<u>Indicators</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1990</u>
1. Commodity output, thousands of rubles	101,900	109,310	120,000	123,000	130,000
2. Volume of VKK products, thousands of rubles	91,302	76,335	81,615	107,975	99,875
3. Proportion of VKK products in volume of commodity output, %	89.6	69.8	67.1	87.8	76.1
4. Proportion of VKK products in volume of products subject to certification, %	99.8	99.8	99.6	99.7	99.7

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MANAGEMENT SEMINARS HAVE LONG HISTORY

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 176-178

[Article by O. S. Vikhanskiy, candidate of economic sciences, Moscow State University: "It Has Already Been 17 Years"]

[Text] Annual theoretical seminars have been conducted under the leadership of Professor G. Kh. Popov since 1970. Specialists in the theory of management spend 1 week in January in the suburbs of Moscow discussing a management problem that has been announced ahead of time. Initially the seminars were organized through the efforts of the Center for Problems of Management of the Economics Faculty of MGU and were intended for workers of this center as well as a small number of their colleagues from other VUZes and scientific research institutes. Therefore the first seminars were oriented mainly toward working out training courses. But gradually the seminar began to change into a large-scale scientific forum which regularly gathered together practical specialists and management scholars from throughout the country. With time the subject matter that was discussed also expanded and it included questions of controlling scientific and technical progress, interbranch complexes improvement of centralized management under the conditions of developed socialism, and so forth. Each seminar was accompanied by a publication of the papers, and from the published collections one can see how consistently the subject matter departed from the narrow tasks of improving teaching work.

The 17th seminar (1986) was the first to be devoted not to current or general theoretical questions of management, but an analysis of the historical experience of planned management of the economy. The participants included professors and instructors, scientific associates and management specialists.

Participants in the first plenary session heard and discussed papers by Dr of Economic Sciences R. A. Belousov, doctor of jurisprudence A. M. Rubin, Dr of Economic Sciences G. A. Lakhtin and Candidate of Economic Sciences E. B. Koritskiy, which were devoted to the experience of the establishment and development of the Soviet system of planned management of the economy. It was emphasized both in the papers and in the discussion that the objective course of the historical development of the socialist economy in the USSR conditioned many of the specific peculiarities of the system of economic management. At the same time attention was drawn to examples of successful solutions to

large-scale national economic problems and the need to utilize analogous solutions in today's management practice.

The second plenary session was devoted to methodological problems of studying the historical development of systems of economic management. In the papers by candidates of economic sciences V. I. Marshev, O. S. Vinkhanskiy, Ye. V. Kossov and V. L. Tambovtsev they analyzed the mechanism for applying past experience under modern conditions and described the spectrum of tasks facing researchers on the history of systems of economic management.

Attention was devoted to a study of the experience in economic management under capitalism by the speakers in the third plenary session: Dr of Economic Sciences N. A. Klimov, Dr of Historical Sciences M. P. Yeroshkin and Dr of Economic Sciences G. Kh. Popov. The participants were especially interested in the paper by Professor G. Kh. Popov, in which he analyzed in detail the preparation and organizational issues related to the peasant reform of 1861.

At the final meeting papers were given by Dr of Philosophical Sciences S. T. Guryanov, candidate of economic sciences Ya. Leymann, Dr of Economic Sciences L. N. Kachalin, and candidate of economic sciences S. A. Vasilyev. The most typical feature of all the papers on this day was the desire to suggest practical measures for improving economic management based on positive experience that had been accumulated.

Within the framework of the seminar there was a joint conference of readers of the international journal PROBLEMS OF THE THEORY AND PRACTICE OF MANAGEMENT and EKO. What the two magazines had in common were the desires of the readers to elucidate foreign practice in economic management more extensively and to respond to the problems of the day as well as to check more closely on the effectiveness of the publications.

Evenings were set aside for innovative measures at the seminar. The greatest response was to the "round tables": on computerization of economic activity, which was conducted by Candidate of Economic Sciences Yu. P. Voronov, and on directions of sociological research, which was conducted by Dr of Philosophical Sciences S. T. Guryanov.

The seminar demonstrated a unanimous opinion: the experience in managing public production requires more constant attention and an essential expansion of historical and economic research. Without a profound knowledge of the past it is impossible to count on a successful solution to problems that are oriented toward the future.

From Publications of the Seminar

"Methodological Problems of the Theory of Management of the Socialist Economy," Voronovo, Moscow Oblast, 1970.

"Personnel for Management of Socialist Public Production," Klyazma, Moscow Oblast, 1971.

"Organization of Processes of Management of Socialist Production," Krasnovidovo, Moscow Oblast, 1972.

"Problems of Territorial Management of Public Production," Ostoshkov, Kalinin Oblast, 1973.

"Problems of Organization of Improvement of Management of Socialist Production," Kalinin, 1974.

"Problems of Management of Scientific and Technical Progress," Tarusa, Kaluga Oblast, 1975.

"Problems of Target Program Management of Public Production," Naro-Fominsk, Moscow Oblast, 1976.

"Problems of Interbranch Management of Public Production," Naro-Fominsk, Moscow Oblast, 1977.

"Utilization of Nature: Problems of Management," Rastov Yaroslavskiy, 1978.

"Problems of Management of Territorial Production Complexes," Tarusa, Kaluga Oblast, 1979.

"Economics and Effectiveness of Management," Naro-Fominsk, Moscow Oblast, 1980.

"Problems of Teaching Management," Moscow, 1981.

"Improvement of the Interaction Between Branch and Territorial Management of Socialist Production," Pushkino, Moscow Oblast, 1982.

"Problems of Management of the National Economies of Large Cities," Pushkino, Moscow Oblast, 1983.

"Problems of Management of Increased Labor Activity of Workers in Socialist Production," Mytishchi, Moscow, Oblast 1984.

"Problems of Improvement of Centralized Management of the Economy Under the Conditions of Developed Socialism," Mytishchi, 1985.

"Problems of Historical Development of Planned Management of the Economy," Pushkino, Moscow Oblast, 1986.

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CONVENIENT METHOD OF CHECKING ON WORK DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 179-182

[Article by Ye. A. Kozlovskikh, division manager of the USSR Stroybank (Shadrinsk, Kurgan Oblast): "A Convenient Method of Checking on Execution" [Text]

In spite of the large number of control systems, one can boldly state that the main one is still the system of entries on desk calendars and in diaries intended for a specific year and published by the press. For these entries we use an ordinary school notebook with 18 sheets. Each day of the month is given one page in order, beginning with the first--with a total of 31. The date is placed on the left upper corner of the left-hand sheet and on the right upper corner of the right-hand sheet, which makes it possible to leaf through the notebook with the thumb of the left hand (as is pictured in the drawing in the section entitled "Contemplation of a Book" in EKO No 3 for 1985) and quickly find the necessary date. The page is divided along the vertical by lines in the following way: 1.5-2 squares from the left--the number of the entries; 4-5 squares from the right--a note concerning execution; from this line on the left there are 4-5 blocks which is for the person responsible for execution; from here 2 blocks on the left is the date and frequency of the performance; the space remaining in the middle of the strip is "What To Do." A horizontal line divides the page into two sections: the upper one for periodically repeated assignments and the lower one for checking on one-time jobs. The ratio of the sizes of these sections is determined by the specific nature of the work.

In the column "What To Do" the assignment is entered in brief form, if necessary, with reference to the document according to which it is to be carried out.

In column 3 of the first section one enters the frequency of the execution, and in the second section the number of the month in which the assignment is to be carried out. In the fifth column of the first section, one block is allotted for a note about the execution in one quarter (the first in the first and so forth). The execution in the first month of the quarter is designated by an ascending diagonal--/, and in the second one a descending one--|, and in the third one, a circle--0. If the assignment is not carried out on time, the

note is entered with a colored line. In the second section it is more convenient to enter the note in the form of the date of the actual performance.

The notebook for the current year is made out at the end of the preceding year when one decides precisely on the list of reports and work and has analyzed the time periods and quality of their performance. First, in the first section, one transfers from the old notebook to these same pages the assignments for which the deadlines have not arrived and there have not been any remarks. This basically pertains to statistical and bookkeeping reports. Then, assignments for which there were remarks and one considers the possibility of changing the time for performing them or the person in charge of performing them, and they are entered into the new notebook with an indication of the change. After this, taking into account the degree of loading of the days and workers and planned time periods for performing the work, new jobs are entered into the notebook. In the second section one transfers from the old notebook the work which has a time period in the new year and subsequently assignments are entered as they arise.

In the morning of 1 January, have opened the notebook to the first page and looked at it for 3-4 days in advance, we have a clear picture of the assignments that are to be carried out. And thus each day as we approach the end of the month we come to the end of the notebook, noting the performance of the work as was indicated in the explanation for filling out the fifth column. On the first of February we open the book from the beginning and again we will have a list of assignments that are to be carried out at the beginning of the month. Moreover, there is information about the performance of work during the preceding month (in this case in January), and this information will be accumulated from month to month.

In the explanation we shall show how the page for 10 August will look if it is opened, for example, on 6-7 August (that is, looking over the work ahead). For example, under point 1 there is an assignment with a reference to the document according to which it is to be carried out. This work was done seven times during the year from January through July, and since it is to be done monthly it is necessary to do it again before 10 August (that is, a report on the results for the seven past months). After it is done we note in the third block (since it is the third quarter) a descending diagonal (that is, the second time during the quarter). The work under point 2 is performed in the first month of the quarter, and the work under point 3 in the third month.

In the second section one can see that there have been one-time jobs on 10 January, one of which was not done on time. The third point shows that by 10 February an assignment had been carried out which was the same as in point 1 of the second section on p 25. Point 12 tells us that it is necessary to check on how Mukhin is carrying out the inspection whose result must be sent to Moscow on 10 August.

As we can see, when using this system of control, in the first place, there is no longer a need to write down the same assignment several times; in the second place one can clearly see the load for the various days of the month and for the various workers; in the third place, when analyzing at the end of

the year it is easy to evaluate the performance of the services and individual workers; fourth, if one introduces the notebook into a bureau or division, all workers can check on the fulfillment of the assignments of the collective when the particular worker is absent; and, fifth, the system does not require any additional devices and is simple to use.

10	What To Do	Time	Performer	Done
1	Information from Instruction 16/010 of 27 January 1983 in PEO	Month	Petrova	XX/
2	Report on SKM Fund in PEO	Quarter 1	Ivanova	III
3	Expected payback of long-term loan to divisions	Quarter 3	Ilina	
4	Inspection of technical division on measure No 12 of inspection (Feb) and so forth....	Month	Me?	XX
<hr/>				
1	Send division No 7 annual report	01	Vdovin	10.01
2	Inspection of data for introduced capacities	01	Mukhin	14.01
3	See 25/2.1	02	Guseva	09.02
4	Write articles for a newspaper on results of Quarter 1	04	Me	10.04
12	Send Moscow inspection of machine plant and so forth	08	Mukhin	

If necessary, one can allot two pages per one day, using a larger notebook.

For assignments and jobs done every week, at the end of the notebook one can allot two pages using the model of a school diary. Here under the note concerning execution it would be more convenient to allot 13 blocks, using 4 weeks for each block ($13 \times 4 = 52$ weeks a year).

At the end of the notebook one can include a section called "Complaints" which will help in analyzing the executive discipline at the end of the year. As an example, an entry in it using the page that has been shown

- 10.1.1. March, mistakes in calculations of tables
- 10.1.1. November, one-day delay in sending

and then under that will mean that, for example, the work of Petrova violated executive discipline twice during the year. (Here from the left are shown the

date of the month, the section, and the number in order). Entries are made as shortcomings are discovered and they can be easily analyzed at the end of the year.

With the proposed system it is possible also to introduce a personal pocket notebook, by changing it somewhat.

When you have tried this system you will discover other of its merits as well.

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BOOK ON TIME FACTOR REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 183-186

[Review by Academician A. M. Rumyantsev of the book "Nevospolnimyy resurs (o faktore vremeni v nauke i k tekhnika)" [An Irreplaceable Resource (Concerning the Time Factor in Science and Technology)], by S. D. Beshelev and F. G. Gurvich, Moscow, "Nauka", 1986]

[Text] To reduce the time periods for the assimilation of new technical equipment and technology to one-third to one-fourth the current level, to radically change the ratio between extensive and intensive factors, to increase the growth rates of labor productivity as a result of accelerated introduction of advanced technical equipment and technology--these most difficult tasks were set for science and production by the 27th CPSU Congress. They were dictated by the current condition of socialist management and rely on the objective requirements of the law for economizing time under socialism that was defined by K. Marx as the first law of collectivist (communist) production. The primary requirement of management under socialism is to solve scientific and technical problems promptly and well, and on this basis to create new technical equipment and utilize it effectively.

The time factor has an extremely complex influence on the realization of scientific and technical innovations. The dialectical nature of the development of science, technology and production, the contradictions between the growing complexity of technical systems and the decreasing period of their useful life as a result of the ever accelerating obsolescence of products, and the influence of general socioeconomic conditions on the duration of the cycle of "research-production" make it difficult to radically accelerate the realization of innovations. In order to efficiently control the rhythm of updating technical equipment and technology, it is necessary to have a profound understanding of the peculiarities of the given processes in the age of the scientific and technical revolution. In this connection there is no doubt about the timeliness of the book under review. S. D. Beshelev and F. G. Gurvich have set for themselves the complicated problem of considering the influence of the time factor on the development of science and technology and showing the irreplaceability of its losses under the conditions of the scientific and technical revolution.

John Bernal once noted that in science more than in any other human institution it is necessary to study the past. The book shows how as science and technology have developed, people's attitudes toward the measurement and saving of time have changed. In the past many scientific ideas and inventions clearly appeared "ahead of their time": either the society was not ready to receive them or there was no possibility of technically embodying them or applying them in practice. Examples of "untimely" ideas are frequently instructive in and of themselves.

But in the age of the scientific and technical revolution it still frequently happens that ideas, inventions and projects needed by the society are not introduced into production for a long time. In this connection the authors repeatedly returned to the problem of the timeliness of scientific and technical innovations and the influence of the losses of time on the development of science and public production. From the examples they give that confirm the existence of isolated paths of development of science and technology, one can see that the time periods for the development, and especially for the practical realization of any innovation depend on the real conditions and interests of the people. The book considers the modern specifics of this realization, the structure of the cycle of "research--production" and the conditions for optimizing the life cycle of technical systems.

The limitedness of resources, the growth of the productivity of public labor, and the rapid obsolescence of scientific information and the most technical achievements increase the value of early effects from the ever-increasing expenditures on scientific and technical progress. Yet acceleration of scientific and technical progress is not a goal in itself. The effectiveness of new technical equipment is reflected primarily in the increased savings on total expenditures. A greater depth (and sometimes also duration) of the development of projects in the initial stages of the creation of technical equipment can provide for greater savings of public expenditures and increase the effectiveness of public production. The possibilities of accelerating research and development in each stage have objective limits that are determined both by resource and by technical and social limitations. This is why optimization of the life cycle of machines is always a compromise between technical specifications, time periods for their achievement and the necessary expenditures. The authors analyze the peculiarities of the interaction of these factors using many examples.

Under modern conditions one of the most important prerequisites for intensification of the economy is an investigation of the needs of the society and the possibilities of satisfying them within the necessary time period. Considering the interaction between the development of science and technology and the capabilities of production, S. D. Beshelev and F. G. Gurbin show that the main reference points in the age of the scientific and technical revolution are the rates of obsolescence of products. While under capitalism the goal of creating technical innovations consists primarily in crowding out existing technical means with new ones and thus providing profit, frequently to the detriment of the society, in socialist production the development of science and the updating of technical equipment should be oriented toward increasing the effectiveness of public production.

Optimization of the life cycle of machines is of greatest importance. As experience shows, in this cycle, along with the growth of the quantity and complexity of scientific and technical programs, it becomes difficult to have centralized coordination of the interaction of the workers. Especially great difficulties arise when solving complex problems whose initiator is science, but their practical realization presupposes the active participation of industry. Significant interruptions in the realization of innovations are caused not only by a lack of organizational coordination, but also by the specific nature of the processes and stages of the innovation cycle. Discussing these peculiarities, the authors consider in detail the problem of comprehensive analysis of the cycle "research--production," and the sequential ties when taking into account time, expenditures and the effect in each stage as well as the influence of intensification of scientific research and experimental design work on the life cycle of the items.

Intensification of science is impossible without improving its technical base and increasing the role of the human factor. Extensive application of computer equipment improves the quality and reduces the time period for research and development. At the same time a strengthening of the technical base and the collectivity of scientific labor does not diminish the significance of personal, creative factors. For successful scientific activity it is not enough to have equipment and qualified scientists and specialists. It is necessary to provide conditions for the growth of creative activity.

The key to further development of the theory and practice of accelerating scientific and technical progress lies in an in-depth analysis of its motive forces and the conditions that provide for saving time in all stages of the creation of new technical equipment and technology. Such is the monograph's leitmotiv.

One would hope that in the future the authors would consider in this key the planned "social order" for science and technology for the future which goes beyond the framework of the period that can be seen with the given material and technical base.

The book is easy to read, complicated issues are presented simply, and they are illustrated with numerous examples. One would think that this would be interesting both to scientific workers and workers in industry as well as to the broad reading public.

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LIST OF SELECTED NEW BOOKS PRESENTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 186

[Article: "New Books"]

[Text] The "Ekonomika" publishing house plans to publish 137 new books in 1987. Some of them have been written by specialists who are known to our readers as writers in EKO. We think that the magazine's readers will be interested in becoming acquainted first with a list of these books, and then with the works themselves directly.

Astafyev, V. Ye., Povolotskiy, L. Ya., and Khaykin, V. P., "Ekonomicheskiye stimuly NTP v novykh usloviyakh khozyaystvovaniya" [Economic Stimuli for Scientific and Technical Progress Under the New Conditions of Management].

Baltaksa, P., and Klivets, P. G., "Slagayemye effektivnosti. Opyt peredovykh predpriyatiy dnepropetrovska" [Variables of Effectiveness. Experience of Leading Enterprises in Dnepropetrovsk].

Zhamin, V. A., Sitaryan, S. A., and Dzokayeva, T. K., "Oktyabr i ekonomicheskiy progress" [October and Economic Progress].

Karpunin, M. G., "Stil rukovodstva i khozyaystvennaya perestroyaka" [The Style of Management and Economic Restructuring].

Kuznetsova, N. P., and Shirokova, L. N., "Rayonnoye regulirovaniye zarabotnoy platy" [Regional Regulation of Wages].

Moskalenko, V. P. and Balan, M. F., "V tvorcheskoy poiske. Opyt sumskogo mashinostroitel'nogo NPO imeni M. V. Frunze" [In Creative Search. The Experience of the Sumy Machine Building Scientific Production Association imeni M. V. Frunze].

"Predpriyatiye v usloviyakh intensifikatsii. Opyt yevropeyskikh stran SEV" [The Enterprise Under the Conditions of Intensification. Experience of European CEMA Countries], ed. by R. N. Yevstigneyev and V. K. Senchagov.

Smekhov, B. M., "Logika planirovaniya" [The Logic of Planning].

"Upravleniye trudovymi resursami" [Management of Labor Resources], Ref. 8.
Ed. by L. A. Kostin.

"Ekonomicheskiy rost i podiyem narodnogo blagosostoyaniya" [Economic Growth and Improvement of National Well-Being], ed. by Ye. G. Antosenkov.

Yuksvyarev, R. K., Khabakuk, M. Ya., and Leymann, Ya. A., "Upravlencheskoye konsultirovaniye. Teoriya i praktika" [Management Consulting. Theory and Practice].

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STAYING ABREAST OF SCIENTIFIC INNOVATIONS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 86 pp 187-190

[Article by Article by V. Aydinyan (Yerevan): "A Puddle in the Scientific Cross-Section"]

[Text] In order to stay on top you must keep up with the times. And you should not be skeptical. Why can they do this, and we cannot? We want to rely on science too. They have computers, and are we not as good as they are? They have sociologists, psychologists--we want them too!"

They say to us: "You have a small plant. Strange logic!" So a large aircraft has a jet engine, and does the small one have a steam engine? Briefly, we convince them all. We have a computer center, computers, a staff--complete progress.

Of course there were dejected voices from the local areas: is there any advantage, they ask? But try to reflect the opposite approach: it will do no harm, and we will have the prestige of a leading enterprise. Conferences, reports, exchange of experience, press, television. This is already a big plus, and as for the rest of it--time will tell. Well, and when the computers were humming from their intellectual effort, the skeptics remained silent. They understood: large affairs were beginning, and they looked at both sides since the wheels of progress could not be stopped....

At first the sociologist chaps gathered momentum: they walked around, looked and thought. The precise direction and the main goal appeared. Then the deputy director fell down in a puddle. If he had figuratively fallen down he would have survived. But he actually did. And the puddle was not on the street and not in the courtyard, but right in front of the personnel division. The deputy director was going about his business, he was thinking, and then he slipped and fell.

And so the boys could see a large goal: to enter all the social factors there were into the machine. After a preliminary study they decided that they would circulate a questionnaire. In the third shop they got stubborn: nobody has this right, and they would complain. But when it was explained to them that it was not painful, they agreed, and even enjoyed answering the questions.

The person who is far removed from science thinks that a puddle is just a puddle, so what is the big fuss about? Turn the valves and call Auntie Aykush with her rag.... And yet, some puddles reflect very serious problems. And if you dig deeper into the puddle, you can find a sea of causes and effects.

At that time work has developed and it is such that the computer has barely managed to digest the information--it was smoking from the strain. Especially when the second shop began to produce washers that were not impregnated. What was happening? The shop chief threw up his hands. They aroused the division of technical control, the division of labor and wages, and the special design bureau, the energy engineers are writing reports on the technologists and the technologists on the designers. The shop has the same technical equipment and the same people as before, but the washers are being produced without impregnation. In a word it became clear that it was not a technical question; the fine points have been confused here. They called in the "service for a cheerful mood."

As might have been expected, an entire complex of factors was revealed. The warehouse worker Aykaz had gone to Gamzachim where one of his relatives was having a child. The person who was materially responsible could not leave the key. But he could not refuse to go, either--it is not every day that a relative has a child. One must look to the future--a boy will grow up and one day will ask with reproach in his eyes: "Tell me, Uncle, where were you when I was born?" How do you justify yourself?...

Two canisters of the impregnation fluid was not enough and on the second day they began to save, but on the third day the washers were dry. This was nothing, they would manage, there were enough efficiency experts in the shop. But as fate would have it, Ripsik from the impregnation section had his own drama. To be sure, such dramas happen within every day until they get married. But what a drama! You will not try to say that impregnating the washers is more important than human destiny. Well, she did not notice, well, she missed it, but she should not have to pay for it with her personal happiness!

While Ripsik was on the telephone explaining whom he had been seen with at the Sevan Theater yesterday, a hubbub arose in the shop: the bushing had fallen off from a pin of the spindle machine. It was necessary to turn on the machine, but there was no bushing.

He did not try to get out of it. Yes, I took the bushing, it was I. So what? Am I not a person? Do I not have people around me, friends, a family? Do you think I do not want to do good for people? People will be people, and all of them take something home: a spool of thread, a package of cigarettes, a piece of cable. Am I to blame because I work at this damn plant? When I come home my wife looks at me expectantly and the children have a question in their eyes: what did Papa bring us? The neighbors' papas bring things home, but ours comes home empty-handed. His work is probably meaningless, and our Papa is probably a meaningless person. And what do I take from here? Washers? Thank you, I do not need them. Once in my life my neighbor had that for a bushing--how could I refuse him? How could I look my neighbors in the eye?

If you were bothered by the authority of the plant, do not forget that it is formed out of the authority of the individual workers!

The phenomenon of the top schnitzel required a special study. As a questionnaire of public opinion showed, after lunch the number of breaks increased sharply among people who had had the schnitzel for lunch.

"Well, of course, of course," the chef was swinging his ladle, "where can you get edible schnitzel, and do you think I am here making millions from your kopecks! No, you are not guilty, I am guilty because I agreed to work here. I agreed because I am a fool. Two weeks ago I purchased a niva for my youngest son. From his own money which he had put aside for a rainy day. But who can buy a car with their own money? Thank God, nobody knows about that, or else the entire public catering system would be laughing at me. But the fact that the schnitzel is bad--who has not experienced that? Add my schnitzel to 2,000 other complaints of yours--I agree, I will honorably take responsibility along with you."

These were, as it were, the main reference points on the path to the truth, but there were also accompanying circumstances to be clarified. Three workers, for example, could not approach the machine tools because of the piles of shavings, and they did not have the opportunity to remove them because Akop had taken the electric cart to Shangavit to drink kvass. Usta Karo had left 3 times--he was going to the plant committee to find out when they would turn on the showers. I have already been waiting for 30 years, he explained, and do I have the right to get clean before going on pension? Additionally, two people had broken pipes on that day, four had been called to school, one had a toothache, and in the neighboring vegetable store they had cucumbers for pickling.

It would be necessary to systematize all these facts and clarify: what impeded the shop's collective from producing washers with impregnation? Of course, not everything was clear. For instance, it turned out to be a difficult matter to translate the information from the language of the chef to the language of the computer, especially certain of his expressions.

The social information accumulated. Finally the machine received an assignment: to find the square root from the puddle in front of the personnel division, divide it by the age of the warehouse worker's relative, multiply it by the difference between the quantity of horsepower of the Niva engine and the schnitzels that were eaten, and arrange all this in one series with small cucumbers and kvass and the kvass that was drunk by Akop, and bring it to a point of complete consumer readiness, but before putting out the printout embellish the total with Ripsik's personal drama.

Unfortunately, some of the recommendations developed on the basis of the research, in spite of the depth of their scientific development, did not take into account the real capabilities of the plant. How, for example, could one take Ripsik's friend's bonus away if he worked at a different automotive base? Would there be enough money to open a gastrointestinal sanatorium at the plant? Would it be expedient to arrange the sale of bushings from pins of the spindle machine at wholesale cost for members of the collective?

In order to keep their feet on the ground, workers of the "Service for a Cheerful Attitude" decided to simplify the task. The final recommendations turned out to be so simple that they were austere: to wipe up the puddle with a rag, to throw the chef out on his ear, to turn on the showers and to increase discipline.

"Now are you convinced of what a powerful force science is?" the director said in the dispatcher office. "The puddle would not have dried up for 3 years, and the algae would have grown in it. And one would not have been able to see the logical tie between the schnitzel and its consequences. And what a refined and precise conclusion concerning discipline! But the laws of progress are irrepressible. We must not sit on our laurels, especially if we do not have any yet. It is necessary to look further, to proceed more rapidly, or they will catch up with us. Here our neighbors from the button plant have installed a synchrophasotron. Do you have any idea what a leap this is? Out of yesterday, bypassing today, and immediately into tomorrow!"

You say that we have made all this up out of fantasy? Alas, it all exists. Washers without impregnation, bushings sneaked out and a warehouseman with a relative. Well, concerning the sociologists and psychologists, perhaps, this was somewhat exaggerated--there are not enough of them yet, but they are already coming, young and ambitious people, they are already knocking on the door. Let us quickly wipe up the puddle before we let them in. Or else they will come in and, not yet knowing what is waiting for them, they will take a step and slip and...no, science has so much work anyway, why place on its shoulders also a task which can quite easily be taken care of by Aunt Aykush with a mop and bucket?

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